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NATIONAL CENTER FOR HEALTH SERVICES RESEARCH
AND HEALTH CARE TECHNOLOGY ASSESSMENT
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HIV-Related Training Needs, Programs, and Costs

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
National Center for Health Services Research
and Health Care Technology Assessment

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PROTOCOL 6

HIV-RELATED TRAINING NEEDS, PROGRAMS, AND COSTS

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Acknowledgments

This protocol was prepared for the National Center for Health Services Research and Health Care Technology Assessment with the Palo Alto Medical Foundation/Research Institute, 860 Bryant Street, Palo Alto, California under contract No. NCHSR-28287-0050. The report was prepared and submitted by Thomas L. Hall, James R. Knickman, Nancy Cross Dunham, and Eve Wittenberg.

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PROTOCOL 6
HIV-RELATED TRAINING NEEDS, PROGRAMS, AND COSTS

INTRODUCTION

This report outlines a research program designed to improve our ability to estimate the impact of the AIDS epidemic on training needs and costs. The purpose of the report is to develop research protocols that can be used by the National Center for Health Services Research and Health Care Technology Assessment (NCHSR) to guide the development of:

* Methods for synthesizing and assessing current knowledge and opinion about training needs of health care professionals on AIDS and on HIV infection

* Methods for synthesizing and assessing current knowledge and opinion about means of meeting those needs

* Methods for describing and evaluating the major AIDS-related training programs that presently exist, and

* Methods for estimating the costs of needed training programs

The protocol outlined in this report is part of a larger effort by NCHSR to begin a health services research program on the costs of AIDS and HIV-related illness. Earlier reports, prepared by a consortium of researchers at four institutions, have presented research protocols focused on the following areas of interest:

* Total direct costs of medical, social, and support services for persons with AIDS and AIDS-Related Complex (ARC)

* Comparisons of the cost-effectiveness of various treatment modalities

* Comparisons of the cost-effectiveness of alternative models for organizing services for persons with AIDS

* Comparisons of the direct and indirect costs of AIDS with the costs associated with other illnesses, and

* The costs associated with testing for HIV

The AIDS epidemic has already had a major impact on the health care delivery systems of several major U.S. cities. The number of cases in communities outside these metropolitan areas is expected to increase dramatically in the next few years. As the epidemic spreads and many infected persons progress on to disease, increasing numbers of health workers and volunteers will be required to provide services. In turn, service expansion will encounter increasing concerns with personnel recruitment, training, and retention.

Such problems may become acute, especially in areas of the country already experiencing shortages in various categories of health care personnel. Given the present and the potential future shortages and the concerns of health care providers regarding HIV-related disease, it is essential that appropriate educational strategies and support structures be developed to help ensure the availability of adequately trained personnel.

Individuals with AIDS and ARC have complex care needs that present a variety of special problems for health care personnel. Fears, myths, and misconceptions about how AIDS is transmitted abound among health care providers. In part, these misconceptions are due to a lack of complete and accurate information. Few persons in the health care workforce have been adequately prepared to address the range of needs presented by AIDS and ARC patients. Appropriate intervention requires a basic understanding of methods of infection control, medical management of the disease process, and appropriate responses to the psychosocial and cultural aspects of the disease.

The personnel dimension of the AIDS epidemic has yet to receive attention commensurate with its importance. To date, little attention has been given to specifying the range of training programs needed to ensure adequate numbers of appropriately trained health care personnel to provide HIV-related services. The anticipated costs of this training also have received little attention.

The research proposed in this protocol will not answer every question relevant to training issues. Rather, four important elements of a research agenda on training issues have been identified:

* An analysis to identify training needs, especially among workers who have already finished their basic training,

* An analysis of existing training approaches to document current capacity and methods of training

* Detailed evaluations of leading training programs to measure the relative effectiveness of training strategies in meeting a range of goals, and

* An analysis of the costs of alternative training strategies, that will permit assessment of the cost-effectiveness of key approaches to meeting training needs

In choosing research issues on which to focus attention, it was determined that information relevant to making public policy decisions concerning training needs is needed relatively quickly. Thus, research issues were selected that related to pressing public policy questions that can be answered now. It is appropriate, however, to keep in mind that the research suggested in this protocol should represent only an early generation of research on training issues. The results of the proposed studies should guide the design and selection of future research initiatives.

This report is divided into four parts. Section I reviews the published and unpublished literature on AIDS-related* training issues and summarize the views of more than 25 experts in diverse aspects of AIDS training and service who were consulted with regard to this protocol. Section II presents a brief overview of a conceptual approach to the estimation of training requirements and reviews potential uncertainties that may affect estimates of training needs and priorities. Recommendations for addressing the questions posed by NCHSR, encompassed by four interrelated tasks, are presented in section III. Appendixes A-C include other supplementary information.

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*Unless otherwise apparent from the context, the terms "AIDS-related" and "HIV-related" have the same meaning in this report. Although "AIDS" is in more common use than "HIV", it should be understood that AIDS is simply the end-stage of an infection by the human immunodeficiency virus, and that training relevant to the care of persons with AIDS will necessarily involve training relevant to ARC and other lesser conditions.

I. TRAINING NEEDS, METHODS, COSTS AND PRIORITIES: A REVIEW

A. Training Needs: A Review of the Literature

The AIDS epidemic was identified in 1981. Hence, the literature is still very limited with regard to staffing and training needs. Preliminary estimates are being developed by many health care facilities, local and regional government bodies, schools, and other established training centers. Efforts to develop educational and training programs are in their early stages. The following literature review covers the assessment of manpower and training needs, educational programs, and the costs of training efforts related to the epidemic.

1. Overview to the Literature Search

Because of the recency of published literature on these topics, the conventional sources of bibliographic citations were found to be insufficient to provide a thorough overview of the existing information on AIDS training and education. The computerized database Medline, including Hospital Planning and Administration, produced over 280 citations specific or potentially relevant to AIDS from 1977 through 1988, of which approximately 30 of these references were directly relevant to this protocol. In addition, the NTIS (National Technical Information Service) database produced about 30 AIDS-related citations-- none of these citations was directly relevant.

More useful and up-to-date sources of research and information on AIDS training and education were found in the abstract books produced from the Third and Fourth International Conferences on AIDS (1987, Washington; 1988, Stockholm). Some 5-10 studies of training needs or descriptions of educational programs were presented at each conference. Several of those presented at the Third Conference have subsequently been published. Other sources of literature included personal communications with agencies developing programs (Health Resources and Services Administration [HRSA], the National Institute of Mental Health [NIMH], and the Centers for Disease Control [CDC]), AIDS literature biblio- graphies (NCHSR, 1987; NIH, 1987), and communication with researchers familiar with the field.

For background literature relating to continuing education and effective behavior change, all issues of The Journal of Medical Education and The Journal of Continuing Education in Nursing were searched from 1985 through 1987. For specific information on the significance of attitudinal change in the training/education of providers working with HIV-infected persons and similar populations, Medline was searched for the past 10 year resulting in over 150 citations; 20 of these references were directly relevant.

2. Estimating AIDS Workforce Requirements

The literature review identified a wealth of materials relevant to the general task of estimating workforce requirements, both for entire health systems and for specific program components. Numerous citations with "AIDS" or "HIV" among the search terms made reference to current or anticipated needs for trained personnel to care for HIV-infected persons, but almost none of these references provided either quantitative estimates of this need or discussed possible methods for making such estimates. Since estimation methods are, for the most part, generic, they are applicable to many different types of health programs. These methods are reviewed here.

According to a recent government review of health professions requirements studies (DHHS, 1986), the four most frequently used methodological approaches are need-based, demand/productivity-based, professional judgment-based, and health maintenance organization (HMO) based, with the latter two methods being in large measure variants of the first two. These methods are briefly described below. The DHHS 1986 reference cites multiple examples of how each has been used in practice. More detailed discussions of methods for the estimation of manpower requirements are available in such references as Lave, and others (1975), Hall and Mejia (1978), and a DHHS report on four manpower nursing requirements models (DHHS, 1981). The numerous occupation-specific studies that were identified are not cited since they are not directly relevant to this protocol.

a. Need-based methods

This method asks how many services will be "needed" in accord with current standards of care. Workforce requirements are based on the number of persons requiring care, multiplied by provider-specific time requirements, and divided by productivity indices and annual working hours to determine required full-time equivalent personnel. The Graduate Medical Education National Advisory Committee (GMENAC) used a "modified" needs-based method to project physician requirements by specialty for years 1990 and 2000 (DHHS, GMENAC, 1981). The method is attractive because it is logical and does not assume, at least at the start, any constraints on the delivery of needed services. Disadvantages include cost, complexity, difficulties in defining standards of care, inability to control staff deployment and utilization patterns, and the potential inability of patients to pay for "needed" care.

b. Demand/productivity-based methods

This method asks how many services of each type will be "demanded", given projected changes in the variables associated with demand. The method does not address whether these services will be "needed." Workforce requirements are estimated by: measuring the predictive value of certain variables associated with demand (for example, age, sex, income, residence) projecting likely changes in these variables over time and converting the projected demand for services into required personnel through the use of indices of productivity and time worked. Advantages of this method include apparent realism and precision while disadvantages include costs, complexity, data limitations and potential inappropriateness for services for which a demand model may not be relevant (for example, maternal care).

c. Professional judgment-based methods

Professional judgment involves some of the same conceptual steps used in the needs-based methods. The approach differs, however, in that professional judgment takes into account not only patient needs, but also variables such as service costs, patient ability to pay, and the system's ability to control the production and/or utilization of services. Major limitations of the method include the tendency to make overly optimistic assumptions and/or to encompass too many variables into one or two major assumptions. An extreme but frequent example of potential problems with this approach is the adoption of target manpower-to-population ratios that have been achieved elsewhere but which are unrealistic for one's own situation.

d. HMO-based methods

This method begins with the observed utilization rates and staffing indices of HMOs that appear to be providing adequate treatment to their subscribers. The observed staff requirements are then applied, perhaps with some adjustments, to the population at large. HMO methods are relatively easy and inexpensive; they are based on reality (at the HMO) and can help suggest what level of care (and staffing) could be adequate. However, since HMO utilization rates tend to be quite low and their beneficiaries may be atypical of the general population, national extrapolations based on HMO rates may result in underestimations of staff and service requirements.

e. Workforce requirements for AIDS

There was almost nothing in the published literature that directly addressed either how one should estimate potential workforce requirements for AIDS or what these requirements might be. However, a useful start has been made with regard to physician requirements in a study prepared by Lewin and

Associates for the Federated Council for Internal Medicine (Needleman, 1987). According to their calculations and based on the modified needs-based method used in the GMENAC study, they estimated that by the year 1990 about 20 million visits for HIV-related problems would be made to general internists and four subspecialities of internal medicine. Their model projected this volume to rise to almost 28 million by 1995 and to drop to around 23 million by the year 2000--numbers that represent about 2 percent of the estimated total for all doctor visits. Although the proportion of HIV-related visits is small, AIDS was estimated to account for 4-8 percent of the cumulative rise in internist requirements depending on the specialty under consideration.

The literature review on these topics led to three conclusions. First, at present there is almost no quantitative information specific to health workforce requirement projections for the AIDS epidemic. Second, requirements projections can vary widely depending on the method and underlying assumptions used. And third, the application of any of these methods for projecting AIDS workforce requirements would result in estimates of full-time equivalent (FTE) personnel requirements for a region, facility or program. To convert FTEs into "persons needing AIDS-related training" would require assumptions regarding the distribution of part-time involvement in AIDS-related work. Since most AIDS care is given on a part-time basis, this conversion problem could represent one of the more difficult aspects of developing AIDS training needs. The implications of these conclusions are discussed more fully in section III.

3. Impact of Training on Changing Attitudes and Behaviors

Both the AIDS literature and researchers agree that negative attitudes toward HIV-infected persons are prevalent among health workers and significantly hinder quality care for this population. While current AIDS-related training efforts attempt to address existing negative attitudes of health workers toward AIDS patients, the literature is still inconclusive about the effect of educational methods on attitudinal change. The results of a literature search of the past 10 years on efforts to change attitudes of health workers towards diverse client problems, including AIDS, are briefly presented in this section.

Attitudes toward homosexuals and substance abusers (irrespective of the issue of AIDS) have been researched extensively in the past. Homophobia has been found to be prevalent among physicians regardless of AIDS, as evidenced by a survey conducted by Mathews and others (1986) prior to the outbreak of the epidemic. They found almost one-quarter of surveyed physicians to be homophobic according to a standardized test of attitudes toward homosexuality (HATH scale). The more recent graduates from medical school are more accepting of homosexuals than less recent graduates, and physicians report themselves to be more accepting than their test scores indicate.

In a review of the literature and a survey of emergency room workers, Biener (1983) attempts to explain the psychology of health professionals' attitudes toward substance abusers. Such attitudes are dependent upon characteristics of both the provider and the patient. The social distance (either perceived or real) between the provider and the patient (that is, how much they differ on social characteristics such as age, race, income, class,) contributes to attitudes; the farther apart they are the more negative the provider's attitudes. In addition, health providers tend to view patients who they perceive as causing their own illness as criminally deviant. Thus, their attitudes toward them are punishing rather than permissive.

Chappel (1987) showed the effectiveness of small group formats and patient management discussions in promoting attitudinal change among medical students toward substance abusers. Similar factors proved to be effective in improving the attitudes of medical students toward homosexuals (Bauman and Hale 1985). Such research indicates that attitudes can be affected through educational methods and that certain methods are more effective than others. However, the research does not prove a link between attitudinal change and improved clinical practice.

A study of medical residents by Warburg and others (1987) addresses this point. These researchers compared residents participating in a special alcoholism training program to those receiving the standard alcohol treatment training included in their regular curriculum. While the authors could not find a causative relationship between negative attitudes or knowledge and practice behavior, they did find differential behavior between the two groups. Those residents who had the special training were more likely to treat alcoholic patients themselves than to refer them to other specialists. In addition, they were more likely to refer alcoholic patients for treatment of their alcohol problem after treatment of other medical problems than the non- trained residents. As the authors note, these findings suggest the importance of supervised clinical training in affecting practice behavior; attitudinal or knowledge change may be insufficient alone.

Identifying the causative factors that determine providers' attitudes toward patients is an essential link in designing programs to affect such attitudes. In a review of the literature and a survey of emergency room workers, Biener (1983) attempts to explain the psychology of health professionals' attitudes toward substance abusers. Such attitudes are dependent upon characteristics of both the provider and the patient. The "social distance" (either perceived or real) between the provider and the patient (how much they differ on social characteristics such as age, race, income, and class) contributes to attitudes, and the farther apart they are, the more negative the provider's attitudes. Patient cooperativeness (how well the patient conforms to the traditional doctor-patient relationship) also influences providers' attitudes. The fact that substance abusers are strongly disliked by physicians can be explained by the perceived social distance between the two (physicians perceive substance abusers as derelicts, although that is not generally the case), and by the aggressive and often uncooperative manner that characterizes substance abusers. In addition, health providers tend to view patients whom they perceive as causing their own illness as criminally deviant, and thus are punishing rather than permissive in their attitudes toward them. Furthermore, Biener found more negative attitudes among physicians toward substance abusers than among other emergency room staff.

Such theories help explain the attitudes observed among health providers toward AIDS patients. AIDS patients are usually either homosexuals or substance abusers, who are viewed negatively despite their AIDS diagnosis. The AIDS condition usually serves to worsen such attitudes.

As the most common form of training for practicing health professionals, continuing education notably lacks an effective strategy to address attitudinal change. The mandatory nature of continuing education for health care professionals has encouraged a debate in the medical education community about the effectiveness of this method. However, little has been published about the need for training regarding attitudinal and/or behavioral change. As reported in the literature, continuing education has been evaluated using a range of measures such as participant satisfaction, acquisition of knowledge and/or skills, changes in attitudes or behavior, and changes in patient outcomes (Cervero, 1985). Intuitively, patient outcomes are the most complete measure of educational effectiveness (Martin and others, 1986), but this outcome is more difficult to measure than the other methods mentioned, and in practice, it is rarely used.

Although the literature argues vigorously both for and against the value of continuing education for health care providers, a number of trends are apparent:

- Programs that include discussions or other interactive or participatory components are more effective by any measure than straight lecture formats (Greenberg and Jewett, 1985).
- Programs tailored to the specific needs of those being trained are more successful than otherwise (Meservy and Monson 1987; Bowman and Wolkenheim 1987).

- * On-the-job reinforcement is critical to achieving changes in behavior (Wake 1987).

- * Information specifically relevant to the participants is better accepted and learned than otherwise (Peters and others, 1987).

While there is agreement in the literature on these aspects of continuing education, the literature is inconclusive on its effectiveness in changing physician and nurse behavior (Sibley, 1982; Ferguson and others, 1984; White and others, 1985). Furthermore, the literature makes clear that changes in knowledge and attitudes do not necessarily lead to changes in behavior or changes in patient outcomes (Peters and others, 1987).

As the next section points out, however, different factors vary in their importance depending on the health problem under consideration. The AIDS literature suggests that health care workers' attitudes are critical in determining their behavior in treating HIV-infected patients, perhaps to a greater extent than with other types of patients. Thus, educational effectiveness may be to some extent disease- or condition-specific--what works best for one disease may not be optimum for another. Effective approaches for AIDS-related training are not yet known because of the current lack of literature on AIDS education and training.

4. AIDS-Related Training and Education Needs

This section looks at training needs from two perspectives. The first is derived from a variety of surveys of health worker knowledge, skills and attitudes regarding AIDS (most surveys refer to AIDS and not the more inclusive category of HIV infection). In the aggregate these surveys provide a useful, though still incomplete, picture of training needs across a variety of disciplines. The second perspective involves professionally determined training needs that have been presented in the literature. The combination of these two perspectives can provide a point of departure for establishing training priorities and research needs for the future.

a. Survey research on training needs

Most of the surveys of training needs focus on physicians, but vary widely in terms of type of physician studied, the region of the country from which the sample is drawn, the recency of the data, and the scope of topics questioned. Surveys examine both the technical limitations of providers, as expressed through knowledge and attitudinal factors that affect care, such as fear of contagion and prejudice toward homosexuals and substance abusers. The distinction between these areas becomes blurred, however, in the case of skills. For example, taking a sexual history requires both the knowledge of what questions to ask and a willingness to accept the information they elicit. Thus, surveys of training and educational needs are thus beneficial in identifying gaps, but are somewhat inconclusive in indicating appropriate remedial approaches.

Table 1 summarizes most of the major surveys done since the start of the epidemic; those referring to physicians alone are in Section A of the table. The year of the study, the population studied, the region/location studied, and the substantive scope of the survey are reported for each survey.

A key factor in the relevance of the results of these studies is the methodology used to determine competence of providers. Self-reporting introduces bias, as does self-selection in surveys with less than 100 percent response rates. None of these surveys perfectly meets these criteria, yet as a whole they are the best available indication of the state of provider behavior with AIDS patients.

Cooke and Koenig of the University of California at San Francisco (UCSF) performed one of the first surveys investigating the attitudes of the medical house staff at UCSF to working with AIDS patients (Cooke and Koenig, 1987). The investigators looked particularly at the housestaff's estimation of their personal risk of acquiring HIV because of exposure to patients with AIDS. Of the 56 medical house officers surveyed in September 1983 (50 percent response rate), 84 percent of the men and 48 percent of the women agreed that health care workers were at risk of acquiring HIV due to work-related exposure to the virus. The gender-based difference in attitudes was statistically significant, and it affected both behavior (women reported less anxiety and preoccupation regarding working with persons with AIDS), and workplace precautions (men reported more frequently mask wearing and gloves despite the actual transmission risks of a particular situation). The predictors of negative response to AIDS patients included inexperience or relatively less previous contact with persons with AIDS.

Another study of house staff in New York City showed similar factors to be predictors of house officers' concerns of acquiring HIV. Link and colleagues surveyed 250 medical and pediatric housestaff in 1986 and found a level of concern that the investigators considered reasonable in relation to the then known scientific risk of contagion (Link and others, 1988). The associative factors of concern included the following: (1) those residents earlier in their training express lower levels of concern; (2) those who have more experience treating persons with AIDS show less concern of transmission; and (3) those in medicine express less concern than those in pediatrics. In other words, the "new crop" of residents is gaining a working competence with AIDS because of their high level of exposure to the illness.

Table 1. Training needs surveys

Author	Year	Population	Geographic Region	Scope
Section A:	Physician			
Arnow	1986	Orthopedic surgeons	5 US cities with most AIDS cases	Treatment issues
Barrett-Connor	1983	Primary care physicians	San Diego City, CA	Knowledge; concerns of acquiring disease
Cooke	1983	Medical house staff	San Francisco (UCSF)	Estimation of personal risks and attitudes
Douglas	1985	Medical house staff and RNs	New York City	Attitudes
Kelly	NS	Physicians	Columbus, Phoenix, Memphis	Attitudes
Lewis	1987	Physicians	California	Knowledge and skills
Link	1988	Medical and pediatric house staff	New York City	Attitudes to acquiring disease
Richardson	1985	Physicians	Los Angeles County	Attitudes
Shultz	1987	Primary care physicians	Minnesota	Knowledge, attitudes and clinical practices
Wachter	1987	Medical	San Francisco, New York City, Portland, Philadelphia, Iowa City	Attitudes and clinical practice

Table 1. Training needs surveys (cont.)

Author	Year	Population	Geographic Region	Scope
Section B: Dentists and Dental Care Workers				
Dove and Cottone	NS	Dentists	NS	Knowledge and attitudes
Gerbert	NS	Dental health workers	California	Attitudes
Section C: Nurses				
Brennan	1987	Nurses	United States	Attitudes
Nelson	NS	Registered nurses	Anchorage, AK; Eureka, CA; So. San Francisco	Knowledge and attitudes
Section D: Hospital Workers				
Gordin	1986	All hospital staff	Washington, DC	Knowledge, attitudes and behavior
Pomerance	NS	Hospital workers	NS	Attitudes
Valenti and Anarella	1984	Hospital staff in AIDS patients	New York	Knowledge, concerns, and behavior
Section E: Health Professions - Students				
Bartnof	1987	Medical nursing, and pharmacy students	San Francisco	Knowledge and attitudes
Kelly	1986	Medical students	Mississippi	Attitudes
Royce	1987	Health	Kentucky	Attitudes

NS = Not Stated

The willingness of physicians to treat persons with AIDS is likely a function of their fear of contagion and their personal attitudes toward those infected with the virus, among other factors. Link and colleagues revealed that 25 percent of the house staff surveyed would not care for AIDS patients if given the choice.

Another study of houseofficers and nurses (Douglas and others, 1985) revealed high levels of homophobia and a prevalent belief that homosexuals with AIDS deserve their illness. A study by Richardson and others of physicians in Los Angeles County in 1985 indicated that the most prevalent deterrent to caring for persons with AIDS was the risk of contagion (33 percent of the sample of 314 physicians mentioned this as a major or moderate deterrent). Discomfort with drug use issues that frequently arise with persons with AIDS was a deterrent for 18 percent of the sample (Richardson and others, 1987).

Richardson and colleagues' sample of physicians included high numbers of both gay and straight physicians, enabling comparisons between the groups. Gay physicians tended to express fewer feelings of anger, fear, or frustration toward their gay patients than straight physicians did, but such feelings were only expressed by 30 to 41 percent of the total sample. Regarding training, over 50 percent expressed an interest in receiving additional training that would enable them to treat more AIDS patients, although the gay physicians expressed this desire to a greater degree than did their straight colleagues. The investigators note that there might be a selection bias in their results, increasing the favorable responses of the group. The response rate to this survey was only 40 percent, however.

Negative attitudes toward AIDS patients were also revealed in a study by Kelly and others of 157 physicians in Columbus, OH, Phoenix, AZ, and Memphis, TN (Kelly, 1987). These physicians' responses to vignettes indicate judgmental, negative evaluations of AIDS patients and gays, mainly because the physicians feel that persons with AIDS are personally responsible for their illness, gays by their promiscuity and intravenous drug users by their illegal habits. Such attitudes expressed themselves in an unwillingness to interact with persons with AIDS, even in simple conversation, and in serious ramifications with respect to the care of AIDS patients.

A survey of 1,000 primary care physicians in California by Lewis and others examined measures of competence in AIDS-related care. The researchers found a low level of knowledge among physicians; only 44 percent of those sampled knew more than three symptoms of ARC, and 44 percent also failed in a hypothetical test of diagnosis designed to measure skills in addition to knowledge (Lewis and others, 1987). The correlates of competence as measured by Lewis and others are strikingly similar to the predictors of attitudes measured by both Cooke and Link. Those most competent were the physicians in internal medicine, those with fewer years in practice (that is, the recent graduates), and those with prior experience in working with AIDS patients. In addition, a low level of discomfort with homosexuals and practicing in a situation other than a solo practice were correlated with a higher degree of competence in treating AIDS patients.

Physicians' desire for additional training in AIDS and the AIDS field was revealed in a survey of Minnesota family practice and internal medicine physicians (Shultz and others, 1988). While this survey showed similar knowledge and attitudes to that found in other studies (for example, about one-fourth expressed some discomfort dealing with homosexuals), a desire for more information was expressed by half of those surveyed. Of these, 64 percent indicated an interest in receiving information packets, 58 percent in continuing medical education courses, 53 percent in informational meetings, 48 percent in information on taking sexual history and 40 percent in training sessions. These findings suggest an awareness on the part of physicians of their shortcomings and a desire to learn.

The remaining surveys of physicians focus on AIDS clinical knowledge and skills, and show they variable results. Barrett-Connor, for example, surveyed primary care physicians in San Diego in 1983 and found a high level of knowledge on certain facts regarding the population at risk for AIDS, disease prevention strategies, prognosis, and transmission issues (Barrett-Connor 1984). A study of orthopedic surgeons by Arnow and colleagues, however, found that "about half who operated considered HIV to be more transmissible than it is" (Arnow and others, 1987). Wachter and colleagues (1988) found a relationship between intensity of exposure (that is, the number of AIDS patients cared for in the last year), assessment of patient prognosis, and attitudes toward intensive care use. Specifically, physicians more experienced in AIDS care tend to utilize the intensive care unit (ICU) less than less experienced physicians.

Research on the training needs of other health care providers is more scarce than that for physicians. This includes studies on dentists, nurses, hospital staff in general, and health care providers in training (students). One study of dental health professionals (including dentists, hygienists and dental assistants) examined the relationship between attitudes and knowledge and actual clinical behavior. Gerbert and colleagues performed a randomized survey of 593 dental health professionals in California and found that attitudes toward AIDS, particularly the perception of the number of patients at risk in one's practice, affect infection control procedures and screening practices to a greater extent than does knowledge (Gerbert and others, 1988). This finding has implications for the focus of training and education efforts.

Studies of nurses' attitudes toward working with HIV-infected patients are also rare. One recent survey (Brennan 1988) of nurses from hospitals that have treated persons with AIDS showed the following profile:

- 73 percent of nurses surveyed are concerned for their own safety
- 47 percent are frustrated by AIDS patients' poor prognoses
- 27 percent are frightened by AIDS
- 47 percent felt they had the right to refuse care to AIDS patients
- 72 percent want more information about personal risk, and
- 59 percent want information about the disease itself

Despite these somewhat hesitant attitudes, this sample of nurses appears to be eager to improve their knowledge.

Another study found nurses to be open to learning and dealing with AIDS irrespective of their views toward homosexuality and drug use (Nelson and others, 1987). Specifically, nurses are not as homophobic as "had previously been thought", according to the authors. Thus, nurses' attitudes seem to be less significant regarding their willingness to care for persons with AIDS than is evident from studies of physicians. This study also found that nurses work effectively with AIDS regardless of how much exposure to AIDS they have previously had. Despite the limited samples in this survey, these findings suggest different training needs and obstacles for nurses compared with their physician counterparts.

Some researchers have taken a broader approach and examined the attitudes and knowledge of entire hospital staffs on the assumption that it is not only those who are directly responsible for patient care who affect and are affected by the presence of AIDS patients. In 1986, Gordin and others surveyed the staff of an urban teaching hospital in Washington, DC, and found a very low level of knowledge among the nurses and physicians. Over half of nurses and almost one-third of physicians believed HIV can be spread through casual contact (Gordin and others, 1987). In terms of attitudes, 44 percent of the entire staff held the view that persons with AIDS have the disease through their own fault, and 34 percent believe that hospital personnel should be allowed to refuse to care for AIDS patients. This last view was significantly stronger among women than men. The translation of this attitude into behavior is indicated by the finding that 38 percent of employees attempt to avoid caring for persons with AIDS (in unspecified ways).

Valenti and Anarella (1986) also surveyed the staff of a hospital but limited their investigation to those who come into direct contact with persons with AIDS. Using data from early 1984 they found a positive correlation between educational level and knowledge of AIDS, and a positive correlation between knowledge and lack of concern of contagion (that is, high knowledge correlates with low concern). However, they also discovered a disparity between knowledge level and behavior; knowledge does not translate into decreased fear or other behavioral change. This finding is discouraging for traditional educational efforts that focus on knowledge transference.

A third study of hospital workers found significant levels of stress, discomfort, and perceived risk among such workers when in occupational contact with patients with AIDS (Pomerance and Shields, 1988). Regression analysis of 256 responses revealed that knowledge of transmission was negatively related to perceived risk and stress, while positively related to comfort level of contact with AIDS patients related positively to all three factors.

The final surveys mentioned here examine knowledge and attitudes of health professions students. Bartnoff and colleagues (1987) found a strong negative attitude toward caring for persons with AIDS; about one-fourth of medical, nursing and pharmacy students surveyed believed that employees should be allowed to refuse care to persons with AIDS, and 5 to 33 percent would prefer to avoid caring for AIDS patients. In addition, while there was a significant difference in perceived knowledge about AIDS between self-identified gay and lesbian students and straight students, their performance on knowledge tests was not significantly different.

Two additional surveys of health students confirm this negative attitude finding. Royce and Birge (1987) found homophobia among students at the University of Kentucky, which predicted less empathy for and a greater fear of persons with AIDS. Kelly and others (1987) replicated their vignette study of physicians among students and found negative and prejudiced attitudes toward both AIDS and homosexuals patients (regardless of their illness).

b. Professionally determined training needs

In the absence of adequate empirical evidence on training needs, many AIDS and education experts have delineated the need for training of various providers based on the responsibilities required of them. For example, Scheitinger, an advocate and implementor of training programs, has stressed the importance of educating nurses regarding disease transmission and the needs of AIDS patients in order to avoid lost staff time due to emotional reactions when AIDS patients arrive on hospital wards (Scheitinger, 1986). Spero has called for action by the deans of nursing schools to integrate AIDS education into nursing curricula because of the pivotal role nurses play in administering care, teaching care skills to others, and protecting the health care environment (Spero, 1988). A similar justification for the training of physicians is supported by the American Medical Association (AMA); physicians are a primary source of health information to the public, and thus must be knowledgeable of the epidemic (Hotchkiss, 1988).

The impact of the epidemic on the training of medical residents is vividly described by a physician at UCSF, indicating the needs, stresses, and obstacles faced by physicians in training and dealing with the number of AIDS patients and the particular demands of their care (Wachter 1986).

Recently, Cotton has called for a two-tiered physician response to treating HIV-infected persons (Cotton, 1988). She suggests that various conventional training techniques be used to train all internists and pediatricians "to detect HIV infection, counsel patients regarding testing and prevention, and treat those who are asymptomatic or in the early stages of AIDS-related complex" (Cotton, p. 520). Cotton states that patients with full-blown AIDS should be attended by physicians with special training, which would be acquired through 6-month to 1-year AIDS fellowships. Moreover, she predicts a new AIDS subspecialty to provide the intensive training needed to respond to the disease. This type of response suggests the growing perception in the medical community of the widespread lack of knowledge regarding treatment of HIV infection and the approaches being considered to fill the void.

There appears to be general agreement among the professional community about the rationale for training and the desire of many to provide training for all providers. However, there is little agreement now about the specific, detailed needs of each provider group with respect to AIDS training.

A government effort to detail training needs by type of provider was initiated by HRSA in a series of AIDS curriculum task forces convened in 1987 for eight health care disciplines (physicians, dental care providers, nurses, physician assistants, emergency medical technicians, social workers, public health workers, and health service administrators). Each of these task forces developed a set of recommendations regarding the training priorities of its providers (DHHS, 1987; Dunham, 1988). Briefly, their results are as follows.

Physicians. A shift from a tertiary to a primary care focus for the management of HIV-infected patients was seen as being necessary. This recommendation for a shift in emphasis derives from recognition of the importance of continuity of care provided by the primary care system and by a perceived inability of tertiary care institutions to sustain the service impact that will be imposed by the growing incidence of HIV disease. Therefore, core curricula focusing on HIV infection issues need to be developed at the undergraduate, residency, and continuing education levels.

Dental care professionals. Infection control concerns are paramount for this group, and the panel stressed that universal infection control procedures should be taught and encouraged of all practitioners as a routine part of the care of all patients.

Nurses. Nurses need to be encouraged to follow the CDC infection control procedures established for HIV. Educational curricula should include the pathology of AIDS at all levels of registered nurse (RN) training, and peer education among nurses should be encouraged. One possible approach to training is the development of clinical specialties in AIDS or immunology.

Physician assistants. The educational needs of physician assistants working with HIV-infected patients need to be documented. Practicing physician assistants need continuing education programs on AIDS that are easily accessible, and curricula at physician assistant schools should integrate AIDS training, including mechanisms to deal with the stresses of caring for such patients.

Emergency medical technicians. Because these providers are often the "first responders" in medical emergencies, it is essential that they be well-trained in HIV-related issues. However, EMTs receive on average only 1 hour of training in infection control procedures and, since this is often judged too technical for the EMT audience, the educational effect is limited. The educational gaps identified by this panel are training in basic infection control procedures, transmission of disease issues, the proper use of disinfectants, and the legal and ethical issues surrounding the care of HIV infected persons.

Social workers. AIDS content should be included as an integral part of all courses for social work degrees at all levels. Continuing education programs should be developed and accessible for social workers at different levels depending on the workers' primary service provision.

Public health workers. The highest priority groups of personnel for training efforts should be those who are in contact with the high-risk populations for HIV infection (such as public health nurses, family planning clinic staff, and community health center staff, methadone maintenance clinic staff). This panel also recommended agenda for community-based organizations, schools of public health, and government and legislative bodies.

Health service administrators. Health care managers occupy key decision-making positions with respect to the organization, financing and delivery of care to HIV-infected patients. The task force recommended that in the immediate future emphasis should be placed on the development of training programs for those presently working in the field, so that managers will be able to address more effectively the rapidly developing problems caused by the epidemic. Such programs will need to have an immediate practical value for managers.

5. AIDS Training Programs

Although hospital administrators, government planners, school administrators and others have begun to develop educational programs for health care providers, few of these efforts are described in the literature. Those that have been documented provide some insight into the approaches being tried and the implied needs they attempt to meet. In addition, some interventions have been systematically evaluated for effectiveness, although these tend to be the less comprehensive programs. Such evaluations and descriptions of programs in use will be discussed in this section.

a. Training program descriptions

Federal government efforts to promote education and training regarding AIDS have been initiated by three agencies: NIMH, HRSA, and CDC.

NIMH has funded 21 sites to perform on-site AIDS education for professionals from a variety of fields, including health care providers. Each site tailors its programs to the needs of its community, and there is widespread variation across sites. For example, in San Francisco, UCSF has contracted with NIMH to assist the nursing and medical schools in developing AIDS curricula, sponsoring grand rounds, and implementing an annual national AIDS conference in the city and other activities directed toward students, house staff, and faculty. In other sites with less extensive community education efforts, contractors focus on less academically oriented programs. The contractor in Chicago, for instance, is training police officers regarding AIDS. In general, NIMH's approach is to fund projects that provide direct training to persons dealing with HIV-infected persons. NIMH has contracted with COSMOS Corporation to perform an evaluation of their contractors, which should be available in late 1988.

HRSA has established a program to train existing health care providers across the nation in AIDS Education and Training Centers (ETCs). As a regional training program, each of HRSA's contracting ETCs will provide training to providers in a multi-state region of the country. The programs have tended to operate more on the "train the trainer" model in contrast to the individualized programs sponsored by NIMH. The shared focus of all sites is to change the behavior of providers, with the goal of increasing willingness and ability to treat persons with AIDS (HRSA, 1987).

CDC programs appear to have different target groups from those specified by HRSA. CDC gives priority to both professional and technical level personnel while HRSA has given emphasis to physicians and nurses. Through 10 Sexually Transmitted Disease (STD) Prevention/Training Centers, CDC provides direct training on STDs and AIDS. A variety of courses are offered at each center, including a general STD course in which a minimum of 2 hours is dedicated to AIDS, and AIDS Updates, which are 1- or 2-day courses devoted exclusively to HIV issues. Most courses are designed for groups of 8 to 10 persons. In 1987, 2,339 persons received training in AIDS through this CDC program at an approximate cost of $406 per classroom hour (Yvonne Green, STD Division, CDC, personal communication, August 4, 1988). CDC also provides workshops, clearinghouses on AIDS, in-service training programs and other forms of education to all levels of health workers (Mason and others, 1988).

b. AIDS training programs described in the literature

Hospital-based training efforts are the programs most commonly described in the literature. In practice, about 90 percent of all hospitals have some sort of AIDS-specific training program for all medical and ancillary/support staff (Andrulis and others, 1988). The majority of the described hospital programs appeared to combine in-service training sessions with lectures and written materials. In one program a hospital conducted a meeting of all management staff with the director and deputy director of the hospital, in addition to the chair of the AIDS committee, to clarify basic information and HIV-related issues. The meeting was videotaped and shown to all employees in an attempt to reassure the employees that they were receiving the same information as management. Written materials were also distributed along with paychecks (Cote and Druslin, 1984). In another program, a hospital presented information to 195 nurses in a lecture format, and followed it with an "AIDS information day" for all other employees. Poster boards detailing the lecture material were posted in the hospital to allow for self-learning by those who missed the lecture (Hartnett, 1987). A third hospital uses a more continuous approach. Bimonthly sessions for all staff in contact with AIDS patients are conducted by this hospital, with individual sessions for departments with specific educational needs (for example, operating room staff) (Stoughton, 1984). Another team of authors stress the need for continuing education as new information regarding the disease becomes available (Jackson and others, 1986).

A slightly different approach is advocated by the California Nurses Association. The "train the trainer" approach provides a group of individuals with training on how to train others in AIDS issues, thus extending the usefulness of the original training effort (Scheitinger, 1987). An additional benefit of this approach is that it provides an on-site person with AIDS expertise at each institution, an accessible source of information for employees. An HMO has employed this technique to train physicians and support staff representatives, who then conduct 2-hour worksite programs for all employees (Hughes and Prasse, 1988). In addition, this HMO offers a 6-hour, off-site continuing medical education program to its physicians, and attracts at least 30 participants per session.

The establishment of AIDS-designated wards at many hospitals has created additional training requirements for these institutions. Two opposite approaches have been described by institutions with AIDS wards. San Francisco General Hospital established the first AIDS ward, and interestingly, provides no formal AIDS educational program for the staff members of that ward (Viele, 1984). The nursing staff is carefully screened before being assigned to the ward, and given a formal orientation, but the remaining training is performed on the job. An educational coordinator position was instituted, however, to teach support staff and the staff of other departments about infection control procedures and other AIDS issues.

In contrast to the approach taken in the San Francisco General Hospital AIDS Division, all staff (including orderlies, ward clerks, and housekeepers) assigned to the AIDS ward at St. Clare's hospital in New York City are provided with 2 days of AIDS-specific classroom training, followed by 3 to 4 weeks of mentoring by an experienced staffperson (McGuirk, 1987). The general nursing staff that may occasionally staff the AIDS unit receives refresher courses on AIDS and unit procedures every few months. The effectiveness of these varying approaches has not been measured, and differences may be due as much to institutional philosophy or the personality of the instructor as to educational theory or perceived need.

Medical and nursing schools are also making efforts to integrate AIDS issues into their curricula. The University of California at San Francisco (UCSF) has a particularly well-known educational program in this area. As of 1988, UCSF offered an AIDS elective that consists of a 19-hour multidisciplinary survey of AIDS, including 23 physician lecturers and 2 panel discussions

(Bartnof and others, 1988). Subjective evaluations suggest the following factors have contributed importantly to the success of the course: (1) a 7:3 ratio of biomedical to psychosocial topics; (2) a comprehensive presentation of infection control and health provider issues; (3) the presence of physicians involved in AIDS care and research as lecturers and role models; and (4) the use of a panel of persons with AIDS and ARC in the curriculum.

UCSF also provides educational programs to practicing physicians and nurses in diagnosis, treatment, prevention and health education under contract with the federal government. Their program anticipates training 5,000 providers over 3 years (Mandel and others, 1987).

In another program, Northwestern University Medical School offers an elective course on AIDS to its medical students. Up to 14 first-year students participate in a 7-week, 11-hour course on the biological and psychosocial issues surrounding HIV infection. The curriculum incorporates films, lectures, discussions, and presentations by persons with AIDS. The evaluation system revealed positive attitude changes among most students and satisfaction with the educational program.

Many locally-based training efforts are currently underway, but have not yet been reported in the literature. An example of such is a program designed by the Visiting Nurses and Hospice of San Francisco. Through a grant from a private foundation this organization is providing five 2-day training sessions in the San Francisco Bay Area to nurses, social workers and others on the care of persons with AIDS. The 16-hour course includes lectures, small group workshops, panel discussions, and a film presentation. Approximately 100 persons participate in each session, for a total trained of 500 for the program.

c. Evaluations of education/training program effectiveness

Evaluations of the effects of existing educational programs are critical to determining the essential factors of training programs. A number of researchers have examined this question, using either a pretest and posttest design on participants in existing programs or using controlled studies of particular training methods. An important factor in these evaluations is the selection bias inherent in the voluntary participation programs. Few of these studies can be conclusive because the programs they evaluate do not necessarily include the complete range of providers who are eligible to participate.

In one evaluation, the impact of a range of educational programs offered to professionals, students and other employees at the UCSF medical center was evaluated using pretests and posttests (Bartnof and others, 1988). The programs varied from 2 to 160 hours, depending on the type of employee being trained. The results show that all employees experienced a significant increase in knowledge following the training. Other results differed by employee category. Infection control procedures improved only in registered nurses and some physician groups. Attitudes improved significantly in nurses alone, while the fear of AIDS decreased significantly only in nonpatient-contact employees. These results indicate the differing impact of educational efforts on different employee groups.

A survey of over 1,200 health care providers participating in 90-minute lectures followed by question and answer periods reported positive changes in HIV knowledge and attitudes, but found differing results by employee type (Wertz and others, 1987). Given the same presentation, those providers who had responsibility for establishing regulations for the care of AIDS patients showed significantly greater improvement on knowledge and attitudes than those providers whose responsibilities included supervision only. Such a discrepancy, given the identical training curriculum, suggests the need for programs designed specifically for the needs of each particular staff group.

Pretests and posttests were used to measure the effect of an educational program for perinatal staff at San Francisco General Hospital (Nelson and others, 1987). A 4-month education and support program was implemented for the nurses in the nursery, labor, and delivery departments. This program included open staff meetings, didactic programs, onsite reinforcement of techniques, and implementation of perinatal infection control procedures. The posttests showed improvements in many areas; the nurses exhibited increased knowledge of HIV transmission and infection control, increased discharge teaching, increased referrals for followup care, reduced fear, and more confidence in caring for AIDS patients. The program apparently succeeded in effecting behavior and attitude changes, although the evaluation process did not indicate the specific factors responsible for these changes.

Another study of obstetric staff compared an experimental group that attended an AIDS workshop with a control group that received a nonrelevant workshop (Sherr, 1988). The 79 program participants exhibited significantly decreased anxiety about contact with, taking blood from, and delivery for HIV-infected women as compared with the control group. Knowledge also increased in the trained group relative to the controls. However, the participants' decisionmaking regarding screening low-risk pregnant women for HIV showed no change.

Dentists have been studied in a similar manner. Gerbert and colleagues (1987) found significant improvements on all knowledge and attitude measures between pretests and posttests of dentists who participated in a three-stage educational program. The format of this training is unique: two eight-page bulletins mailed at 2-month intervals supplied the AIDS information. These were followed by an analysis of the participants' performance on the pretest, designed to motivate and direct individual study. The final component was a conference call between five or six other dentists participating in the training and AIDS experts to discuss the written information and answer questions. Although the results indicate that this method of education was effective for this group, the authors note that the results may be biased up not only because of selection bias, but (as with any pretest or posttest method) the improvement in knowledge or attitudes cannot be definitively traced to the educational process. These authors speculate that the participants may have done some self-study during the period of training, improving their performance on the posttests.

One final study attempted to distinguish among training methods for a group of physicians. Lewis and others, (1986) surveyed over 600 physicians on knowledge and competence in treating AIDS before and after an educational program that consisted of a printed brochure, an audio cassette, or a video cassette. Their analysis indicates that all participants' knowledge increased from the pretest to posttest, but the improvement could not be attributed to the educational program. Furthermore, there was no difference across the formats used. Instead, they found competence related to specialty and years of experience; those who have fewer years in practice and the internists scored higher on knowledge and competence. They also found that only approximately 50 percent of those who received materials actually used them, and those who did were the physicians who scored higher on the pretests. Thus, the education was reaching those who need it the least. The authors conclude that educational efforts must be targeted to be effective.

Efforts to provide comprehensive training to entire health delivery systems, with particular emphasis on the attitudinal factors that affect care, are currently underway. Complete data from such programs should be available in the near future to provide better indications of effective educational methods for health care personnel in this field.

6. Costs of AIDS Training and Education Programs

Virtually no information is available on the costs of training efforts, besides that which can be calculated from government grants and contracts. Projections of costs associated with the HRSA training program indicate costs ranging from $55.22 per trainee trained by the University of Colorado center to $241 per trainee at the University of Washington center (HRSA, 1987). These are the only indications of what programs similar to HRSA's might cost since they would need to be standardized for type of program and adjusted to reflect programs operating at design capacity rather than new programs during the development phase. Therefore, the results should be interpreted as only the broadest of estimates.

B. Expert Opinion on Training Needs and Programs

In addition to the review of the literature on AIDS-related training needs and existing programs, development of the recommended research methodologies was advanced by information gathered in semistructured interviews conducted with persons who have had substantial experience with the delivery of HIV-related services or with training health care professionals to deliver such services or both. The majority of these discussions were conducted over the telephone, although some were in person. On average, the discussions lasted about 30 minutes.

The persons we interviewed were selected to be broadly, though not statistically, representative with respect to geographic location, background, and experience of those likely to be familiar with AIDS-related training and workforce issues. The complete list of persons who participated in these semi-structured discussions is provided in appendix B of this report along with the discussion guide used.

The major objective of this process was to begin to gather and synthesize expert opinion on the need for supplementary AIDS-related training for the entire spectrum of health care providers, as well as perceptions of the adequacy of the training efforts around the country. The information gathered in this effort has been important to the development of the proposed research methodologies by allowing for the identification and clarification of the key elements of concern pertaining to AIDS training needs and programs. The remainder of this section of the report summarizes the information and opinions gathered in three areas:

* The adequacy of current levels of HIV-related skills, knowledge, and experience of health care workers

* Existing attitudes of health care workers toward AIDS patients and care, and

* The adequacy of existing training programs on AIDS care and related issues

1. Adequacy of HIV-Related Skills, Knowledge and Experience

In general, the knowledge and understanding of HIV illness, its transmission, and its consequences was perceived by many of those interviewed as being very limited, residing almost exclusively in those professionals who are directly involved in providing AIDS care. For health care workers not currently involved in providing care to persons with AIDS, the basic level of knowledge with respect to subjects such as transmission, pathogenesis, medical management, psychosocial aspects of the disease, and ethical decisionmaking is wholly inadequate given the predicted growth in the incidence of AIDS in the next few years.

Some of these gaps in knowledge and expertise on the part of health care providers can be expected, given the fact that HIV expertise regarding virology, transmission, pathogenesis, and service delivery continues to be a rapidly changing field. The health care system is continuing to undergo shifting "paradigms" with respect to HIV treatment, as well as the political, legal and social environment for persons with AIDS. These continuing changes make it difficult for educators to continually provide up-to-date information for everyone and for health care workers to find places to get the information they need.

Urban-rural differences in knowledge and expertise were noted by several persons interviewed. In general, it is thought that health care workers in the major centers of HIV infection around the country are much better prepared to deal with AIDS than are workers in other areas. It was also noted by several, however, that expertise and knowledge vary considerably by community and by institutions within communities.

Outside the major centers of HIV infection, there may often be a great deal of resistance on the part of health care providers, not only to caring for persons with AIDS, but also with regard to participating in training programs related to AIDS and the care of persons with AIDS. In many nonmetropolitan areas, however, the demand for AIDS-related training is high but there simply are not enough training opportunities available to meet the demand.

In addition to geographic differences in levels of knowledge relating to HIV infection and AIDS, there are also significant differences across occupational categories. Although many health care professionals in the major centers of HIV infection may have adequate knowledge and skills, most lower level health care workers (for example, medical technicians, hospital housekeeping staff, and orderlies) do not yet have adequate information to help them perform their job responsibilities or to reduce levels of uncertainty relating to HIV infection. This lack of knowledge usually results in a great deal of fear, confusion, and inappropriate responses to AIDS patients by these workers.

Other persons interviewed noted that significant need with respect to AIDS-related training presently exists for the following disciplines: (1) mental health professionals, (2) social workers, (3) drug addiction counselors, and (4) community-based agencies and programs.

Thus far, little has been done in health professions schools to prepare workers to deal with the HIV disease process and its consequences. Inadequate preparation at the basic training level is to be expected for those persons who have been out of school for 5 years or more. However, many interviewees thought that even recently trained providers had not received adequate HIV-related training by the time they entered the service delivery system. The inadequate basic preparation seen by these experts helps to emphasize the importance of a continuing education approach for training currently practicing health care workers. A wide variety of HIV educational programs were seen as necessary to make up for these training gaps and deficiencies existing at the basic training level.

Specific deficiencies were noted with respect to the knowledge and expertise of health care personnel and included a pervasive lack of basic understanding about the difference between HIV infection and full-blown AIDS. In addition, not enough emphasis has yet been placed on providing health care workers with sufficient knowledge of the opportunistic infections associated with HIV, for example, signs and symptoms, and appropriate treatment responses. Other persons interviewed noted that health care workers need to develop better skills in managing the physical care of AIDS patients and in dealing with the consequences of AIDS dementia.

A specific deficiency noted in this regard was that most primary care physicians do not yet have adequate knowledge of how to treat persons infected with HIV. Some of the experts interviewed anticipate that increasingly AIDS treatment will become integrated into the mainstream of medicine and that a significant portion of care will be provided in ambulatory care settings. However, it was noted that most physicians are not yet ready to accept that AIDS treatment may become in large part a primary care problem and not just a issue to be dealt with by "AIDS specialists."

Some interviewees did see a potential for developing subcategories of AIDS specialists in several health care occupations. The actual development of these two somewhat conflicting trends (more primary care providers caring for AIDS patients versus the development of "AIDS specialist" categories) will significantly affect future AIDS-related training needs and programs.

Finally, it was noted that for those health care workers who have received sufficient information about HIV infection and medical management, their knowledge does not guarantee that they will have the motivation needed to change attitudes and behaviors with respect to caring for HIV-infected persons. In other words, the amount of knowledge acquired may exceed the readiness to deal with the emotional issues associated with the disease. The gap between knowledge-skills and attitudes-behaviors helps to underscore one of the major themes emerging from these interviews--consistent training, done repeatedly and on a long-term basis, will be the only way that the health care system can begin to ensure that providers will be adequately trained to respond appropriately to the many and diverse needs of HIV infected persons.

2. Attitudes Toward AIDS Patients and Care

A number of the persons noted that the issue of AIDS and HIV infection tends to divide health care professionals into two categories: those who are very dedicated to the issues, and those who want nothing at all to do with AIDS or AIDS patients. In general, attitudes were seen as ranging from terror on the part of some health care workers to those who see AIDS care and treatment as an exciting, if difficult, challenge--as "cutting edge" work.

So far in the course of the epidemic, a significant proportion of health care providers involved in AIDS work have shown a high degree of commitment and dedication. A potential problem seen was that, because of the demands and the high stress involved in caring for HIV-infected persons, these workers are likely to "burnout" and to be replaced by persons of lesser commitment. Accordingly, various persons stressed the need for AIDS programs to make an ongoing commitment to providing staff with an opportunity to discuss their feelings, to share their concerns and, in effect, to "recharge their batteries."

Fear of infection is a major component of the attitudes that health care workers bring to their work with HIV-infected persons, although such fears are likely to decrease as health care workers gain more experience with AIDS patients and with infection control procedures. Attitudes among health care workers appear to be improving, generally, in high incidence areas. However, the AIDS epidemic is apparently creating or exacerbating problems in recruiting and retaining workers in high incidence areas (especially physicians in residency programs and nurses).

Respondents commented that in addition to fears of infection, many health care workers have negative attitudes toward homosexuals and minorities, which impinge upon their abilities to provide treatment in a humane and caring manner. Conversely, it was also noted that there is sometimes an over-identification with persons with AIDS on the part of gay staff, a situation that can cause problems when health care workers lose their objectivity in caring for patients.

The fundamental difficulties involved in attempting to change the basic attitudes and values of people cannot be overstated. Personal value systems on the part of some health care workers may become permanent barriers to changing negative attitudes and behaviors with respect to HIV infected persons and high risk groups (that is, homosexuals and IV drug users). It was noted, on the other hand, that many persons enter the health care field out of altruistic and compassionate motives. Providing such persons with the basic skills and knowledge necessary to deal with fear of infection and medical management issues may go a long way in reducing negative attitudes and inappropriate behaviors. In addition, leadership by top administrative personnel, both at health care facilities and within health professions education programs, is a key factor in setting appropriate standards with respect to attitudes toward persons with AIDS.

3. Adequacy of Existing Training Programs

Regarding the adequacy of existing HIV training programs, the comments of those persons interviewed generally centered on three basic areas: (1) the current amount of training, (2) the training modalities or program formats are that are being utilized, and (3) the basic content of such programs. In general, people seemed to feel that training efforts were beginning to move in the right direction, but that major gaps in meeting the existing need for training continue to exist.

Despite the substantial number of programs developed, the comment was frequently made that many health care workers are barely aware of the programs' existence. Partially, this was seen as steming from inadequate marketing efforts of program planners and implementors. Existing programs must increase efforts to make health care providers aware of the training opportunities that exist.

Not enough training is currently being done outside major metropolitan areas with high HIV incidence rates and caseloads. It will be essential, therefore, that AIDS training programs become more generally available in other areas of the country in as timely a manner as possible. There is increasing evidence that a substantial number of AIDS patients are leaving major urban areas to return to their home towns and families as their disease process progresses. Such patterns will result in an increasing need for adequately trained health care providers in small towns and rural areas or for a mechanism to allow rural providers to access information quickly when they are first confronted with an AIDS patient. At present, mechanisms for the rapid dissemination of this needed information do not exist.

It was also noted that not enough health care workers were being reached by existing AIDS training programs because of employer resistance and/personnel shortages which are endemic in certain disciplines and certain areas of the country. It was suggested that employers are at least partially responsible for the inadequacy of current AIDS training efforts, as they generally do not give high priority to staff training.

Even where there are good programs, people are often not allowed or encouraged to attend because of limited budgets and/or health care worker shortages, especially shortages of nurses. Facilities need to replace the staff who are attending the programs, which create budgeting and/or staffing problems.

Problems such as employer resistance and staff shortages have often meant that AIDS training programs are short, one-time sessions. This type of training format is not likely to be particulary efficacious in helping people deal with their fears and anxieties, or in changing inappropriate attitudes and behaviors.

In attempting to change attitudes and behaviors, it is essential that AIDS training programs are designed to allow adequate time for the training process. It often takes months or years to change behaviors; obviously, one short training program will not be sufficient. Therefore, it was recommended by several persons interviewed that training programs should involve longer training sessions, spread out over time, in order to allow people to process the information they receive and to deal effectively with their feelings and attitudes.

For several respondents the realities of budget constraints and staff shortages highlighted the importance of having trainers available as continuing resources to institutions and communities. For this reason, the "train the trainer" approach is being used by several major AIDS training efforts. The effectiveness of this approach could, however, be limited if many institutions are unwilling or unable to allow all relevant staff to participate in such programs. They also stressed the importance that train-the-trainer programs give adequate attention to quality control, since program deficiencies could have a multiplier effect.

A number of respondents stressed the importance for training programs to be sanctioned by managers and/or administrators. Health care managers must be convinced of the important role they can play in letting people know that AIDS education is important and convinced to encourage their employees to participate. It will, therefore, be important that the planning processes for AIDS-related education programs target both health care administrators and health professions educators for further training.

AIDS training programs will need to devote a significant effort to the identification of the most effective modalities for helping health care workers deal with the complex issues involved with HIV infection. This need helps to underscore the important role that rigorous, ongoing program evaluations can play, as the federal government, educational institutions, and other training organizations continue to plan for and implement AIDS training programs for an ever-increasing number of health care workers.

The complexities of dealing with elements of fear and negative attitudes make it essential that training programs provide people with more than just the essential knowledge of HIV infection. A difficult aspect of designing AIDS-related training programs lies not so much in strategies to ensure the dissemination of specific information, but in helping health care workers get past their fears and resistance. This will require training environments where participants can express their concerns and have them addressed adequately.

Often, these issues cannot be dealt with effectively through strictly didactic approaches, provided in large meeting rooms or auditoriums, although the didactic approach is probably effective in presenting some of the essential information (a baseline level of knowledge is necessary in order to be able to deal with the issues). However, it is important that training programs tailor an approach that will allow participants to deal with the emotional aspects of the issues.

Several persons suggested that one way of minimizing the adverse effect on performance of the health care worker's fears and negative attitudes towards AIDS clients would be to concentrate on developing relevant communications skills. The rationale might be summarized as follows:

* Many health care workers don't particularly enjoy working with alcoholics, drug addicts, homosexuals, or members of cultural minority groups.

* Training programs that try to change health workers' attitudes towards these groups are apt to have limited success since the gap between practitioner and client is just too great for some client groups, and certain groups, such as addicts, are very resistent to being helped by the usual methods adopted by the health system.

* However, if doctors are trained, for example, to take a sexual history or to provide sexual behavior counseling, it

> will not matter whether they personally like their patients or understand their lifestyles, since they will be able to carry out their job effectively.

According to this approach, training emphasis should focus on developing the necessary skills on the assumptions that in the process attitudinal blocks will either diminish or, in effect, will lose importance in the delivery of care.

Finally, an important suggestion made by several of those interviewed relates to the need for trainers to design culturally relevant training programs, which will help prepare health care workers to deal more effectively and humanely with homosexual and/or bisexual persons, drug abusers, and members of minority and socially disadvantaged populations. It is crucial that training programs provide exposure to the human face of AIDS, in order to help participants understand cross-cultural differences among their patients, and the problems and concerns that these differences can cause. It was suggested that AIDS training programs attempt to develop nonexploitative ways for persons with AIDS to be directly involved in the training in order to allow trainees to have opportunities to deal with the issues in personal, human terms.

C. Summary: What We Have Learned, What We Need to Know

The review of the literature, the input of expert opinion with respect to AIDS training needs assessments, and the assessment of the adequacy of existing AIDS training programs have revealed a number of major areas of interest that call for further study and evaluation. One important theme reiterated throughout our review and analysis is that the training needs of all health care workers regarding AIDS issues must be more precisely determined. General knowledge of HIV illness, its transmission, and its consequences is very limited, residing almost exclusively in those health care workers who are directly involved in providing AIDS care. Much of this knowledge has been gained through on the job experience, with or without supplementary training programs.

The results of the surveys on health worker knowledge and attitudes that have been done to date cannot be generalized to the entire country, and most surveys have been nonrandom, limiting somewhat the utility of their findings. In addition, much of the research on knowledge of HIV and attitudes toward persons with AIDS has focused on physicians. The need for further, more systematic and explicit, assessments of the training needs of other health care professionals and of nonprofessional health care workers (for example, hospital housekeeping staff and aides.) is indicated.

Thus far, very little training on HIV disease seems to have been provided to health care workers during the basic training which they received in school. This inadequate basic preparation points out the importance both of accelerating the incorporation of relevant training at the basic level and of using the continuing education approach for training practicing health care workers.

A second major theme is that knowledge and skills vary significantly among and across the various categories of health care workers who have been surveyed, indicating the need to orient training to the specific needs of the designated target group. A general consensus that has emerged is that training programs must carefully target their information and training modalities to the specific audiences of health care workers they are hoping to reach in order to be effective. The disjuncture between knowledge of AIDS issues and the attitudes/behaviors of health care workers toward persons with AIDS is the third major theme of this analysis. While many health care workers do have the necessary information, it is not guaranteed (or even likely) that this information, by itself, will be sufficient to motivate most of them to change their attitudes or alter their behavior.

Fear of infection is a major component of the negative attitudes that many health care workers have toward persons infected with HIV. In addition to these fears, however, many health care workers have negative attitudes toward homosexuals, minorities, and IV drug abusers that are likely to affect their behavior adversely in caring for AIDS patients. The importance of attitudes in determining behavior regarding AIDS care is evident. Surveys of attitudes of health care workers have found an alarming proportion of health care workers who are clearly resistant to providing medical care to AIDS patients.

The relationships between knowledge, competence, attitudes, and behavior change are not yet well delineated from the studies done to date. It does appear, however, that attitudes may be a more important factor in the determination of behaviors relevant to AIDS than is the case with many other diseases. A wide variety of educational approaches is currently being tried, especially in high HIV incidence and caseload areas such as San Francisco and New York City. To date, however, few careful, systematic evaluations of the existing programs have been completed; in general, studies of educational effectiveness show mixed results. Wide variations exist among many programs in the scope, and duration of the training offered, the specific topics presented, the format of materials and teaching methodologies used, and support mechanisms offered to participants. There is, however, almost no information currently available to help program planners evaluate relative effectiveness of various approaches in both imparting the necessary information to participants and in motivating them to change their attitudes (or at least behaviors) toward persons with AIDS.

Given the seriousness of the personnel/training issues for HIV infection, this lack of information on program effectiveness is particularly troublesome. It will be essential that AIDS training programs concentrate significant effort on helping participants overcome their fears and their negative evaluations of the patient population. In addition, it will be important that evaluations of such programs be designed to attempt to identify the most effective modalities for effecting such change in attitudes and to measure the extent to which attitudes and behaviors can be changed by different training modalities.

Finally, there is almost no systematic information that would help anticipate potential AIDS training costs for all those who will need training both now and in the future. The review of the literature has found very little information on the costs of existing training programs. So far many training programs have grown out of demonstration programs, funded by the federal Government or private foundations. Such programs are typically heavily funded for the development of curriculums, teaching and marketing strategies and, therefore, are likely to show somewhat higher costs per person trained than what the actual costs would be once the programs are fully developed. The estimates of training program costs that do exist ignore the replacement costs of training providers; that is, the personnel and financial resources needed to provide substitute workers while people are away from their jobs being trained. These replacement cost estimates should also be considered in the development of projections of the total training costs for HIV infection.

The major conclusions from this review, including aspects that were not covered in any detail in the text, can best be visualized in table 2. The first column lists various categories of information that would be useful to have in order to make informed decisions about the need for AIDS-related training and the desired characteristics and costs of such training. The next columns provide rough qualitative assessments about where we are now or will be shortly based on studies already in progress, and the relative urgency of obtaining additional information. While the table provides only aggregate and subjective responses to what are complex and multifaceted questions, we believe these responses can provide useful guidance to research priorities in the future.

Table 2. Summary conclusions: what is known and what should we know about HIV training needs and costs

Desired Information*	Adequacy of current Information		Urgency of additional information	Observations
	Literature	Expert Opinion		
Who needs to trained? (Which major occupational categories require training and what duties/ responsiblities?)	Adequate	Good	Relatively low	Although there is little information about some occupations, the picture is reasonably complete on this matter. Eventually, all or almost all persons working in the for health sector should have at least some basic information about HIV; those at risk of infection should receive information about infection control.
Basic level training				
What should these personnel learn during their basic (pre-professional) training? (What knowledge, skills, and attitudes should be instilled?)	Very limited	Marginally adequate	Moderate	All health workers in training should receive basic instruction in HIV transmission and infection control. Those personnel categories likely to have substantial AIDS duties also should have additional instruction in diagnosis, treatment, and communications-related skills.
How can they best be taught what they need to know? (Teaching/ learning methods, duration, and timing of training?)	Very limited	Deficient	Relatively high	Evaluation studies, particularly of a prospective nature, could be especially valuable. The results of curricula evaluations concerned with other, somewhat analogous (to AIDS) health problems, such as alcohol and drug abuse, and mental illness, also could be relevant.

Table 2. Summary conclusions: what is known and what should we know about HIV training needs and costs (cont.)

	Adequacy of current Information			
Desired Information*	Literature	Expert Opinion	Urgency of additional information	Observations
What training is now being done at this level? (What courses are offered; what institutions; with what coverage?)	Very limited	Deficient	High	A good inventory of the current status of training could be the starting point for more detailed evaluation studies and for making policies to ensure broad coverage at the earliest opportunity.
What is the cost of basic level training?	No information found	Almost none	Low	Since most of these costs will and should be assumed by the training institutions as part of their normal course of instruction, there should be little need for new information on this topic.
Postbasic training				
What should these personnel learn prior to their initial service with HIV patients? (What knowledge, skills, attitudes should be instilled?)	Marginally adequate	Marginally adequate	High	Information is rapidly being accumulated, and expert opinion can fill in most of the gaps that exist in the literature. Almost no field data are available on some of the smaller occupational categories.
How can they best be taught what they need to know? (Teaching/learning methods, duration, and timing of training)	Inadequate	Inadequate	High	Expert opinion can probably provide more information than the literature. Various studies are in progress or planned that will help significantly. The cost-effectiveness of the different approaches is not known.

Table 2. Summary conclusions: what is known and what should we know about HIV training needs and costs (cont.)

Desired Information*	Adequacy of current Information		Urgency of additional information	Observations
	Literature	Expert Opinion		
What training is now being at this level? (What courses or training programs are offered; at what institutions; with what coverage?)	Inadequate	Inadequate	High	Good information exists on what federally sponsored done programs are doing, and a mail survey, complemented by informed opinion, could quickly generate a reasonably complete inventory of activities. Little information is available on 1) actual or potential training capacity, or 2) existing or potential problems of training program implementation.
What is the cost of postbasic training?	Almost none	Inadequate	Moderate	Good information on contract costs for ETCs and other federally supported programs; almost no information on other programs. Working estimates can be generated quickly with moderate margins of error though (relatively) high per trainee costs encountered during the development phase will need to be adjusted downward to approximate design capacity operating costs. Major uncertainties regarding the degree to which interactive, small group type training will be required. Accurate estimates can be readily done for selected programs but may not be easily generalized.

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*Responses based on impressions gained from the literature review and discussions with persons familiar with the field as to the potential adequacy or information now available or that will soon become available to guide decisionmaking regarding AIDS-related training.

II. POTENTIAL UNCERTAINTIES IN ESTIMATING TRAINING NEEDS AND COSTS

A. Introduction

NCHSR has expressed concern about the potential impact of various uncertainties on future training needs and costs. These uncertainties, in our judgment, fall under four categories:

1. Potential changes in the nature and anticipated scope of the HIV epidemic
2. Potential changes in the characteristics of the infected population
3. Potential changes in HIV therapies and delivery systems for AIDS/ARC services, and
4. Potential obstacles to training program implementation

This section considers each of these four issues and comments on the potential impact of each on training requirements and costs. A summary table on these observations is presented at the conclusion.

1. Potential Changes in HIV Incidence and Prevalence

The evolving characteristics of the epidemic will probably be the greatest single determinant of the eventual training requirements for health care personnel. The major uncertainty in this regard involves the incidence, and consequent prevalence, of HIV infection nationwide, as well as regionally. Even if further HIV transmission were to be stopped in the near future, the number of new cases of AIDS and ARC will continue to rise sharply because of the pool of persons who are infected with HIV but are asymptomatic. In the absence of major therapeutic advances, perhaps 600,000 to 700,000 persons will develop AIDS or ARC before the end of the century.

CDC estimates that at least 1 million Americans are now infected with HIV, of whom more than 72,000 have developed AIDS. Current evidence suggests that at least two-thirds of those infected will develop at least some symptoms within 7 years of their initial infection. Thus, the probability of major increases in the number of symptomatic HIV-infected persons is extremely high.

The likely impact of significant changes in HIV incidence and prevalence on health care personnel training and costs will be almost entirely quantitative. In other words, increasing numbers of persons with AIDS and ARC will require more trained personnel, but this quantitative impact is not likely to affect the qualitative aspects of training content or duration. No specific changes in assessments of training need content, scope and/or duration are anticipated as a result of variations in incidence and/or prevalence.

A further consideration is the potential effect of a change in the virulence of the HIV. Sketchy evidence suggests that HIV is more prone to mutate than most other known human viruses and that a substantial share of the mutations are in the direction of greater virulence. Several different HIV types have been identified internationally although multiple types have not yet been a significant problem in the United States. Despite these findings, there seems to be no reason to anticipate at this time that the virus will take a clinically significant turn for the worse. Moreover, as was noted previously with regard to the possible impact on training needs due to changes in HIV incidence and prevalence, adverse changes in HIV virulence would probably have only a slow and relatively minor impact on the nature of training needs.

2. Potential Changes in the Characteristics of Seropositives

Another factor which could affect training requirements for HIV-related service providers concerns potential changes in the distribution of infected persons by risk group and other demographic characteristics. According to recent CDC estimates (June 6, 1988), the cumulative percentage distribution of AIDS cases by major variables is as follows: 91.3 percent males; 62.0 percent homosexual and bisexual males; 18.5 percent intravenous drug users; 7.3 percent homosexual males who are also IV drug users; 10.6 percent other adults; 1.5 percent children. This distribution is expected to change significantly in the coming years, with increasing percentages of IV drug users (male and female), children, and women infected by heterosexual contact, and decreasing percentages of homosexual/bisexual men. These potential changes can be predicted with reasonable accuracy and should be taken into account to the extent they are likely to affect training requirements.

The significance of such changes should not be exaggerated, however. For the most part, they will be gradual, relatively moderate in magnitude, and will primarily affect only a few metropolitan areas. More importantly, these changes are likely to have only a minimal impact on training content and duration. Different patient populations will call for somewhat different interpersonal skills, but the knowledge and technical skills needed will be essentially the same. Since most HIV service systems will likely be caring for persons from diverse risk, ethnic, racial and demographic groups, those portions of the training programs devoted to "people skills" will, of necessity, have to address the needs of the various major population subgroups, with some differences in emphasis given to each one, depending on local circumstances.

There is little reason to believe that the ratio between persons with AIDS and persons with ARC will change (unless, of course, the definitions of AIDS and ARC are modified, which would do nothing to change the realities of patient care). In addition, there is little reason to believe that the knowledge, skills and attitudes required of health care workers caring for AIDS patients will differ in any fundamental way from those required for caring for ARC patients.

3. Potential Changes in HIV Therapies and Delivery Systems

Any major improvements in HIV therapy or the development of a vaccine or preventive therapy would, of course, have a profound effect on the quantitative, and perhaps less significantly, on the qualitative aspects of the needed training. While hopefully such changes would act to reduce requirements for trained staff, in some situations they could increase staff requirements (for example, increasing the numbers of person alive with AIDS by significantly extending the survival time of those infected). This situation would arise if new therapies extend life but do not significantly reduce the need for care during the time of clinical disease.

Counterintuitive as it might seem, future changes in therapies are unlikely to have a significant impact on either the total number of persons who will require training or on training content, except as this bears directly on knowledge and skills relevant to the new therapies. If therapy changes lead to a rapid and unexpected reduction in the need for HIV services, the adverse effects on training plans will be a small price to pay for the easing of the epidemic. And if therapy changes lead to a prolonged survival of sicker patients, and hence to an increase in the AIDS caseload, the effects on training requirements are likely to be relatively gradual, and hence predictable.

As an example of the effects of improved survival rates, let us suppose that new therapies make it possible to prevent more patients from dying from *Pneumocystis carinii* pneumonia (PCP) or other severe opportunistic infections. This could lead to more patients being placed in intensive care units and to perhaps a higher average number of days of hospitalization per patient. While this could aggravate bed supply and allocation problems, it would probably not mean that more hospital personnel will require training than would otherwise be the case, on the supposition that all personnel apt to provide HIV-related care will already require training. The only exception would be in the event that most care is provided by categorical staff assigned only to AIDS care; in such a case, AIDS training needs would vary directly with the number of staff so employed.

Anticipated increases in the proportion of patients with HIV-induced dementia, however, could moderately complicate staffing and training requirements. Such patients will likely require additional specialized treatments and nursing and custodial care, usually in institutions. Substantial increases in the need for extensive nursing and custodial care would likely expand the number of health care personnel in need of HIV-related training (for example, long-term care facility providers). This development might even result in the introduction of new types of extended care facilities that provide services intermediate to those provided by general hospitals and skilled nursing facilities. The development of such facilities could be accompanied by the creation of an AIDS-specific allied health worker category with its own unique set of training requirements.

As noted previously, alternative models for organizing services for persons with AIDS have been developed in various areas of the country. Important differences in staffing norms and productivity may exist across different models of service delivery. Such models may be described according to the degree to which case management arrangements are used, the degree to which private practitioners become involved in AIDS care, and the degree to which clinic- or hospital-based AIDS services are integrated with or kept separate from other health services. It is likely that whatever the differences between existing patterns of staff utilization according to health care delivery system model, such patterns will change significantly over time in unpredictable ways, even independently of possible changes in HIV epidemiology and therapies. Since rigid control over staffing and service norms is neither desirable nor feasible, the best method of coping with this variable is to monitor the situation carefully and make adjustments in training estimates as appropriate.

4. Potential Obstacles to Training Program Implementation

Perhaps the greatest uncertainties have to do more with the ability to implement the desired service and training programs than with changes in either HIV disease or therapy. Two uncertainties are especially conspicuous: (1) the ability to recruit and retain persons willing to provide care, and (2) the likely availability of adequate financial support for training.

As was evident in the literature review, much has been written about the importance of changing attitudes among health care providers toward HIV disease. This term "changing attitudes," is a shorthand expression that encompasses a variety of interrelated problems, namely overcoming health worker fears about caring for HIV-infected persons; overcoming the psychological stresses that come from caring for relatively young patients with a fatal, wasting disease; overcoming deep-seated antipathies toward caring for persons with markedly different lifestyles; and overcoming barriers to working effectively with persons from different cultures and racial groups. So far the attitude problem has been vexing but not insurmountable; the patient numbers are still relatively small, most patients reside in large metropolitan areas with multiple health facilities to choose from, and many of the health workers involved in HIV care service are volunteers. In the next 5 years or so circumstances could change significantly to the point that even if training plans are well conceived and financed, it may prove difficult to attract trainees into the programs, to get them to provide care once trained, or even to retain for very long those who do provide HIV-related care. The special problems engendered by the intrinsic nature of HIV infection are further complicated by the general shortage of certain categories of health personnel, especially nurses, for which no ready solution is available. Some of these issues will be further considered in our proposed study design, presented in section III.

A second major uncertainty has to do with funding. Training needs and plans can be developed in detail, but alone they can not ensure the necessary funds to support implementation. Although studies will sometimes result in specific policy decisions and action, often they do not or do only to a much more limited degree than that which was recommended. Any study carried out to assess training needs should, therefore, take into account anticipated funding realities--that is, how much support is likely to be available for training, with what assurance, and from what sources. To "take into account anticipated funding realities" does not mean subordinating the study's recommendations to whatever it appears the (training) market will bear; such an approach could result in self-fulfilling prophecies, with the result that training programs are either underfunded or wasteful.

Many issues and uncertainties have been identified in this section but for the most part their impact on training is either likely to be small or, if substantial, the changes are likely to evolve slowly such that training plans can take them into account. The two major exceptions have to do with different aspects of implementation: (1) once needs are determined and plans are made, will health workers be available in the requisite numbers and will they remain in service, and (2) if they do, will the training programs find the requisite support? Our proposed research protocol addresses at least part of the first of these two uncertainties, and the second one will have to be the concern of those responsible for developing training plans. Table 3 summarizes our conclusions with regard to the potential impact of these various uncertainties on training.

Table 3. Summary of issues and uncertainties that may affect training requirement

Issues and uncertainties	Potential impact on training needs for personnel and volunteers*	Likely effects and suggested actions or precautions: observations
Potential changes in the nature and scope of HIV		
1. Changes in HIV incidence	Direct impact on numbers of personnel needed; little impact on qualitative training needs	If survival time remains unchanged, FTE personnel needs will vary directly with the incidence. Changes and effects will likely evolve slowly; monitor situation and adjust estimates as necessary.
2. Changes in HIV prevalence	Direct impact on personnel needs; little impact on qualitative training needs	If survival time remains unchanged, personnel needs will vary directly with the prevalence. If increased survval results in more AIDS dementia and other chronic disorders, this could result in more care being provided in dedicated AIDS facilities and perhaps by specialized AIDS personnel, which would have training implications
3. Changes in HIV virulence	Probably limited impact on numbers and on qualitative training needs	If virulence decreases, prevalence and survival time will increase and perhaps more subacute care will be required. If virulence increases, the extra care requirements may be partially offset by lowered survival time, and prevalence. Changes will likely evolve slowly allowing time for adjustments.
Potential changes in the characteristics of the HIV-infected population		
1. Changed distribution among the several risk categories	Little effect on numerical requirements; relatively minor effects on training emphasis except in extreme situations	Most service programs will be providing care to the several main risk groups so providers will need to be trained accordingly. Programs with high drug user

Table 3. Summary of issues and uncertainties that may affect training requirement (cont.)

Issues and uncertainties	Potential impact on training needs for personnel and volunteers*	Likely effects and suggested actions or precautions: observations
Potential changes in the characteristics of the HIV-infected population (cont.)		
		and/or minority patient populations will probably require additional attitude and skill training beyond that needed by providers where these groups are not numerous. Changes will likely come slowly
2. Changed ratio of AIDS to ARC patients	Little impact on either quantitative personnel needs or qualitative aspects of training	Most providers working with HIV infection will need to about all stages of the illness, and the balance between AIDS and ARC is not particularly relevant to training. Changes will likely come slowly.
Potential changes in HIV therapies and service delivery systems		
1. Improvements in therapies or a vaccine	Could eventually have a major impact on quantity of personnel required; training effects would be limited to imparting new knowledge and skills requirements	New therapies could prolong lifespan and perhaps increase HIV-related dementia, with implications for long-term care training. Changes are apt to develop slowly.
2. Changes in dominant delivery system patterns	Most potential changes would not affect either numerical or qualitative staffing needs; big increase in private practitioner care would have some impact	If private practitioners become very important, this development would argue for more vigorous efforts at promoting physician training, and dedicated AIDS facilities could lead to a specialized category of largely full-time AIDS personnel. More full-time personnel would perhaps reduce the number of persons requiring training. Changes will probably develop slowly.

Table 3. Summary of issues and uncertainties that may affect training requirement (cont.)

Issues and uncertainties	Potential impact on training needs for personnel and volunteers*	Likely effects and suggested actions or precautions: observations
Potential changes in HIV therapies and service delivery systems (cont.)		
3. Creation and use of personnel trained solely for HIV-related care	Would probably reduce requirements for certain mid-level personnel categories	The numbers that might be so trained would probably be relatively small, and since AIDS-specific personnel could only fill a limited portion of total workforce requirements, the impact would not be great. Changes would likely come slowly and could be anticipated.
4. Changes in reimbursement schedules for HIV patients	Impact on some types of services, and numbers of	A categorical federal program for AIDS patients with liberal benefits could affect, at the some types of services, and the demand for care. The risk of reduced benefits for AIDS patients seems unlikely. Realistically, only changes in federal support would plausibly have an effect on the demand for care. It now seems unlikely that any increases sufficient to impact staffing requirements will be forth-forth.
Potential obstacles to training program implementation		
1. Ability to recruit, retain, and utilize effectively	If personnel are unwilling to care for HIV patients, training programs will be underutilized, or if used, recruitment to and retention in service will be below expectations. Also, if prolonged small group interactive training is essential to change values and enhance communication skills, training	Impact could be substantial and might imperil implementation of the overall training plan and the ability to provide HIV care. There is already a nurse shortage and an anticipated general internist shortage. The effects could become evident at times of rapid AIDS program growth and will bear close monitoring.

Table 3. Summary of issues and uncertainties that may affect training requirement (cont.)

Issues and uncertainties	Potential impact on training needs for personnel and volunteers*	Likely effects and suggested actions or precautions: observations
Potential obstacles to training program implementation (cont.)		
	program capacities and costs will be severely affected.	Part of the research protocol is oriented toward identifying and coping with this problem.
2. Training funds available for training	Will have a major impact on training program capacity and orientation	Projections of likely funds and resources by any method are apt to be very uncertain beyond a year or two, though most changes will probably be gradual; needs estimates should start with what is minimally necessary and then show what further increments could accomplish.

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*Refers to the possible impact that each issue or uncertainty might have on the requirements for personnel and volunteers to provide HIV-related care, on the training needs for such personnel or volunteers, and on the ability to meet these needs.

IV. RECOMMENDED STUDY PROTOCOL

A. A Research Agenda

1. Overview

Materials presented in sections I and II indicate that the potential list of research topics concerning training requirements, programs, and costs related to HIV infection is extensive. A research protocol that attempted to include all potentially important topics could be very complex.

Our proposal is for a much more focused research agenda, one that might be termed a "first generation" inquiry into training needs and costs. Two major reasons lead us to this view. First, the rapidly changing nature of the epidemic and concepts of care argue against embarking on an unduly elaborate set of studies at this time. Second, we believe that the results obtained from the initial studies we propose, when combined with those likely to be forthcoming from various studies and demonstration projects now underway, will make possible good decisionmaking about what further research will be justified in several years.

We recommend that a government contract for a single Training Needs and Costs Study that, in our view, would encompass the four principle tasks listed below:

- An assessment of training needs (Training Needs Assessment)
- An inventory of training program characteristics and constraints, followed by case studies of selected programs (Description of Existing Training Approaches)
- Evaluation of several prototypical training programs to determine their relative effectiveness (Training Program Evaluations), and
- Estimation of training costs (Training Program Costs)

We have written this protocol on the assumption that the work would be performed by one contractor. Although we believe that a single contractor arrangement could help ensure good integration of the four component tasks, this is not essential to the study design.

Each task would require the collection of selected field data and a careful update of the published and unpublished literature. This information would be analyzed and synthesized, and specific recommendations developed. We propose that substantial use be made of expert opinion both through panels and an advisory committee since the views of persons now involved in service and training programs can make a very significant contribution to the final product.

The final products of the proposed study would be a comprehensive set of findings and recommendations with regard to likely training needs, preferred ways of meeting these needs, training cost estimates, and an agenda for further research. The entire protocol would require an estimated 36 months to complete, though the main products from Tasks #1, 2, and 4 would be available in about 24 months. Task #3 would not be started until about 12 months after the start of Tasks #1 and #2. Because of the intrinsic difficulty and relatively high cost of rigorous educational program evaluations, we believe Task #3 should only be undertaken after very careful consideration of the options and of then existing information about relative training program effectiveness.

By way of a final observation, we assume that the training needs and costs protocol could not begin until mid-1989 at the earliest and more realistically, late 1989 or early 1990. If concurrent studies are initiated on other aspects of the costs of AIDS care and on alternative delivery system models, their findings could provide valuable input to four tasks described here and perhaps vice versa. The balance of this section covers several points relevant to the entire protocol.

2. Personnel Required to Provide AIDS Care

Our recommendations do not at this time include a study to project probable personnel requirements, either of the numbers of doctors, nurses, volunteers, and others needed to provide AIDS related care in the future or of the numbers of each occupational category that should receive specialized AIDS-related training. Since personnel requirements estimates would seem to be an essential part of the main questions about who should be trained and how much will it cost, we provide our rationale for this recommendation in some detail.

In the literature review (section I), we noted that various methods are in use for estimating health workforce requirements and that as yet almost no quantitative estimates have been made regarding AIDS-related care. We began our work on this project with the intention of including a study protocol to develop requirements estimates and indeed spent considerable time on its design. We are now persuaded that such a study, if done carefully, would be costly, would take quite a bit of time, and perhaps most importantly, would have limited utility in the foreseeable future.

By way of illustration of this last point, if the Lewin and Associates' estimates of full-time equivalent (FTE) internist requirements for HIV disease are realistic, then what? It will make an big difference in the projected training requirements depending on whether one assumes that the 20+ million HIV-related visits to internists are provided by a relatively small number of physicians with busy AIDS practices or whether they are divided among a much larger number of physicians who see fewer such patients. The approximate FTE workforce burden of the AIDS workload can be estimated with acceptable accuracy given what we now know about seroprevalence, the rate of disease progression, and standards of care. The way this FTE workload will be divided up among available personnel is much harder to predict with any confidence, at least at this stage of the epidemic.

Aside from the difficulty of making accurate estimates of the numbers of different persons required to provide AIDS care, we question the potential utility of such information at the present time. The epidemic is changing rapidly, the backlog of persons requiring training far exceeds current training capacity, and for the foreseeable future training programs are likely to be shaped more by available resources and local demands than by any projection of overall national requirements.

Our current recommendation notwithstanding, if future developments make it desirable to estimate the number of personnel needed to provide care at either the national or subnational level, we believe that usable approximations can be generated quickly by a combination of the needs and professional judgment-based methods of estimation. Estimates so derived should be checked against the experience of managed care models since these can perhaps provide some indication of the extent to which personnel use can be optimized.

The Lewin and Associates study (Needleman and others, 1987), as discussed in the literature review, provides a useful example of how one could proceed to estimate physician requirements. Similar changes could be made in the input assumptions used in the Western Interstate Commission of Higher Education (WICHE) or other nurse requirements models in order to develop service specific estimates for this occupational category (DHHS). These national or state level estimates, usually expressed in terms of full-time equivalent personnel, could then be reviewed by a panel(s) of experts in order to derive estimates for the likely distribution according to amount of time spent on AIDS-related care and type of activity. Such estimates could provide useful short-term guidance for likely staff requirements (and training requirements) for a given region or for the nation at a small fraction of the cost and time involved in a full-scale manpower requirements projection study.

3. Priority for Postbasic Training

We recommend that the first round of research on these training issues focus almost entirely on what we will term "postbasic" training. By postbasic we refer to training directed at persons who have already completed their entry level qualifications in medicine, nursing, dentistry, social work, or other professions. Postbasic training can occur either before service (that is, prior to direct involvement in AIDS-related care) or after the person has begun delivering such care. Giving priority to postbasic training will best meet the immediate needs for trained personnel and, since it will likely involve the largest marginal costs, this type of training will probably require significant federal help with its funding and organization.

We acknowledge that over the longer term AIDS-related training at the basic, preprofessional level will become increasingly important. In essence, if doctors, nurses, and others are reasonably well prepared on HIV topics in their undergraduate training, this will both reduce the number of persons requiring additional training and will, to some extent, condition the amount and form that postbasic supplementary training should take. In order to ensure that the nation's medical, nursing, and other education institutions are proceeding to incorporate AIDS training in their undergraduate curriculums, we propose that the government monitor the situation closely, perhaps by means of small contracts with the various associations of professional schools. Desirable major products of such contracts might include 1) estimates of the degree to which substantial AIDS-relevant training is done and 2) periodic summaries of the results of evaluations that have been conducted to assess the relative effectiveness of alternative approaches to training. Except for this suggestion, our four task descriptions do not make any specific proposals for studying undergraduate training programs at this time.

4. Who Should Be Studied?

Many different occupational categories are involved with the HIV epidemic, and eventually some training will probably have to be provided to all of them. However, for this protocol it seems prudent to limit the scope of this training needs protocol only to those categories that (1) in the aggregate represent the great majority of health and volunteer personnel involved in HIV work and (2) may require more than limited on-the-job training and orientation. The following 10 categories are proposed:

- administrators, including public health administrators
- dentists and hygienists
- doctors and physician assistants
- emergency medical technicians (EMTs)
- nursing personnel

- psychologists, counselors, and related occupations
- public health workers directly involved with HIV
- respiratory therapists
- social workers, case managers, and related occupations
- volunteers

We want to emphasize that the choice of categories for priority attention is bound to produce questions of why is one category is "in" and another "out." There is no fully satisfactory rationale for selection, and we want to stress our belief that one should be pragmatic about who to study and how. Indeed, the training needs of some now omitted categories such as phlebotomists and laboratory technicians will likely be very similar to categories that are included. In any event, the training needs, objectives, and methods for the groups just listed will vary widely, ranging from those where the primary concern is infection control (for example, dental personnel, and EMTs) to those where communications skills and attitudes are primary (mental health therapists, social workers, and volunteers). We propose these 10 categories as a point of departure for deciding who to study in greater detail; the initial review phase of Task #1 will provide a sound basis for choosing occupational categories for further study.

5. Advisory Committee and Review Panels

Our recommended study design makes substantial use of informed opinion during all phases of implementation. Such opinion can help guide the inquiry, it can provide valuable input in the absence of field data, and it can help ensure that the final conclusions and recommendations are soundly based and enjoy widespread acceptance. In order to make efficient use of expert opinion, we propose adoption of the following approach.

a. Overview to the consultation process

A relatively long list of potential experts should be developed during the initial phase of the research project. From this list two subgroups are identified: a 10-12 person Advisory Committee to help guide the several component projects through to implementation and four panels of about 20-25 persons each to address matters concerned with both training needs and training programs (the roles and composition of the four panels are discussed in detail in the next section). Advisory Committee members would also participate in the four more specialized panels and would be counted among the 20-25 members in each panel. The selection process should take place during the first 6 months of the research program, the panels would meet toward the end of the first year, and the Advisory Committee would function throughout the project. In addition to their roles as Advisory Committee members or panelists, some of the persons identified in this process could make an invaluable contribution by helping to facilitate or actually conduct the proposed needs assessment survey in service delivery programs in which they are involved.

b. Selection of committee members and panelists

During the first few months of the project a master list should be developed of persons believed to be especially knowledgeable about training needs and/or training program design and evaluation. HIV-related experience would be very desirable but not essential, if other qualifications were exceptional. Potential names would be obtained from sources such as authors of key articles, training and service program leaderships, government, professional organizations, and interest groups. A matrix could be developed that would categorize nominees according to relevant variables, for example, occupation, perspective (such as service program, educational program, and government), type of experience, demographics, and special area(s) of expertise. By telephone consultations and other means the list could be pared and selection made into the two categories, starting with the Advisory Committee, which could then help complete the selection process.

c. Advisory Committee

Over the assumed 3-year duration for the proposed protocol the Advisory Committee would probably have three 2-day meetings during the first 18 months and perhaps two meetings during the last 8 months. Additional individual and conference call consultations could be held as necessary. This Committee would serve as a readily accessible group that the contractor could consult prior to making key decisions and which would help ensure that project findings are relevant to the needs of those likely to use the information.

B. Proposed Task #1: Training Needs Assessment

1. Overview of the Proposed Approach

The broad outlines of training needs for most relevant health occupations are already evident from Part II. Existing knowledge suggests that: (1) current levels of factual information about AIDS are generally quite limited, even among physicians, (2) virtually all health workers, irrespective of their duties, will require a basic level of training in infection control, and (3) training programs will need to give at least as much attention to attitudes, fears, skills, and behaviors as to the transfer of knowledge or information. While these observations have been sufficient for initial planning purposes, the project described in this section is aimed at increasing the specificity of understanding about training needs among workers caring for persons with AIDS.

Our original outlines for a study design included a fairly large multicity training needs assessment survey of health workers involved in AIDS care. As explained earlier, we now believe this would not be cost-effective and instead favor an inductive approach that would place primary reliance on (1) the results of needs assessment studies and before/after training evaluations whose results are likely to be available in the next year or so, and (2) on the advice of expert panels. This information would be supplemented by survey data only where absolutely necessary.

We propose that the training needs assessment portion of the study be completed in three stages: a review and synthesis of existing information; comment and supplementation by expert panels (who will concurrently provide assistance with Task #2); and supplementary surveys, as necessary. This information would then be analyzed, synthesized, and combined with that obtained in the other parts of the study as a basis for developing specific recommendations for action. Table 4 provides a suggested timeline for completion of the individual components of Task #1, which are described in the following sections.

2. Synthesis of Existing Knowledge about Training Needs

During the initial months of the study all available information should be collected that bears on health care workers, social service workers, and volunteers. Information that might measure knowledge, attitudes, and practices[1] relevant to AIDS care among each type of care provider should be assembled with highest priority given to the 10 health occupations of special interest. Several main sources of information would be used:

- Published and unpublished needs assessment and knowledge, attitudes, and practices studies

- Training program reports and pretraining/posttraining evaluations of trainees obtained from AIDS training centers

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[1] Knowledge, attitudes, and practices should also include such attributes as skills, beliefs, values, and fears, all of which are very relevant to providing care to HIV-infected patients.

Table 4. Proposed activity timeliness for Task #1: Training Needs Assessment

Task and activity	Month: 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24
Training needs assessment	
-Data collection/analysis on training needs and surveys	xxxxxxxx
-Identify, recruit panelists and Advisory Committee members (to be used for all tasks)	xxxx
-Send panelists draft review materials and quesitons for comment	xx
-Followup panelists calls as necessary to benefit from their comments	xx
-Send panelists complete documentation to be used in panel meetings	xx
-Two- or three-day panel meetings for an estimated four	xx
-Planning for training needs assessment field surveys if necessary (surveys of selected occupation categories regarding HIV-related knowledge, attitudes, and skills)	xx
-Field surveys carried out	xxxxxxx
-Tabulation and analysis of survey results	xxxxxx
-Revision of draft report, findings and recommendations	xxxxx
-Circulation of draft report to panelists with followup contacts	xxxxxx
-Final review of report	xxxxxx

* Associations of health personnel and of health professional educational institutions, and

* Persons identified during the course of the review who can provide information on specific questions for which other sources are inadequate

Another possible source of information might be the results of the National Health Interview Survey of the National Center for Health Statistics' (NCHS). Starting in May 1988, the NCHS included a detailed questionnaire in its regular schedule of interviews designed to measure AIDS knowledge and attitudes in a representative sample of the U.S. population. Although the survey instrument does not appear to include information on the respondent's occupation and hence one cannot identify the views of health worker respondents (assuming the numbers would be sufficient), the education-specific results may provide some clues at least for likely health provider attitudes, if not for knowledge.

As part of the data collection effort researchers who have carried out knowledge, attitudes, and practices or needs assessment surveys and/or training program evaluations should be contacted and their study instruments requested for potential use or adaptation in the field survey phase that is discussed subsequestly. Collected data should be assembled in such a way as to show for each occupational group what we know, what we think we know but need to confirm, and what we urgently need to know about the group's current knowledge about AIDS topics and infection control; current attitudes, values, and fears as they relate to caring for HIV infected persons willingness to receive training, and to provide care; and relevant skills, (for example, taking a sexual history, and counseling).

The proposed review would generate much information, though important gaps will remain. To help fill in the gaps and especially to help interpret the findings, we propose to use panels of experts.

3. Review Panels

We recommend convening approximately four panels of knowledgeable persons to review, comment on, and supplement information obtained in the course of implementing both the needs assessment and training program tasks (#1 and #2). As indicated earlier, each panel should have 20-25 members drawn in approximately equal proportions from service programs and training programs. Panel members should be selected for their relevant expertise, with attention to ensuring that the panels are broadly representative of different points of view and occupational perspectives. All panels should have at least one articulate person with AIDS who is not also a health care provider. The four panels should deal, respectively, with the following occupational groups:

- Physicians, dental personnel, physician assistants and clinical nurse practitioners (or perhaps in the next group), and emergency medical technicians (personnel involved in direct patient care activities of a predominantly clinical nature)
- Nurses (RNs and Licensed Practical Nurses [LPNs]), respiratory therapists, nurse aides (personnel involved in direct patient care activities of a predominantly nursing or supportive nature)
- Psychologists, social workers, case managers, counselors, and volunteers (health care providers primarily concerned with the psychological and social support of clients), and
- Administrators and public health workers (personnel not heavily involved in direct patient care but who must ensure that the system operates effectively)

For reasons both of cost and complexity we do not favor convening a panel for each of the 10 priority occupation groups. Although some of the combinations recommended above may seem somewhat "forced," we believe the presence of panelists coming from different but not dissimilar disciplines will enrich plenary discussions, and occupation-specific discussions can be managed in smaller working group sessions as necessary. The amount of time spent on each occupational group will, of course, vary widely according to diverse considerations.

The panels are designed both to help fill the gaps in available survey data and to provide study researchers with the benefit of panelist judgments regarding recommendations for action. The panel approach builds on the useful effort made by HRSA in 1987 in which eight 1-day panels were convened to solicit recommendations about training needs and priorities. There are important differences, however, between HRSA's meetings and those proposed here. The proposed panels would meet for at least 2 and perhaps 3 days; they would have much more extensive premeeting documentation; and they would be asked to review and comment on the documentation and proposed agenda before the meeting; they would be asked to review and revise specific findings and recommendations by the end of the panel meeting. Approximately 1 year after the panels meetings the panels would be asked to comment on the draft study report. Since each panel would include several members of the Advisory Committee, continuity and good communications would be enhanced. Specific recommendations for panel operation are:

- Months 4-6: Panel members will be nominated and selected for each of the four occupational groups.

- Month 6: Panelists will be sent a packet that summarizes information on training needs and programs for all of the occupational groups under consideration; they will be asked to review in depth only information relevant to their own panel. In addition to the background information on training needs and programs, the packet will include a detailed preliminary agenda for the panel meeting and a list of proposed "products" of the panel deliberations. The packet will also advise panelists that they will be contacted within several weeks in order to solicit their views with regard to the materials, agenda, and proposed products.

- Months 7-8: Followup calls to panelists will be completed. This followup will have the double objective of soliciting panelist feedback and suggestions for improvement (prior to finalizing the agenda) as well as ensuring that they have read the materials. The information will be supplemented, and the agenda and proposed products will be revised, according to the panelists' suggestions. Panelists will be sent replacements for materials that have undergone significant revision.

- Months 8-9: Panel meetings of 2 or preferably 3 days will be held, at approximately 2-week intervals.

- Months 10-20: Based on the results of the panel meetings, additional information will be collected and reviewed, if necessary. From the panel deliberations, the study staff will develop preliminary drafts of the panel recommendations, as described subsequently.

- Months 20-21: Panelists will be sent the draft final report including recommendations for action, for their review and comments. As with the preliminary information, panelists will be directed to respond to specific questions and will be asked to return their marked-up copy, or to respond by telephone. Nonrespondents will be followed up with by telephone.

After the panel meetings, by month 10 study staff should be able to make informed judgments about the adequacy of available information for each occupational group such as: Does adequate baseline information currently exist on the HIV-related knowledge, skills and attitudes of health workers in this occupational group? Does information exist that defines or suggests the current principal training needs of persons in this occupational category? And do reasonably good instruments exist for assessing training needs for persons in this occupational category? Additional judgments should be possible with regard to training program characteristics and constraints, as described in Task #2.

4. Field Surveys

By the end of year 1 our recommended study approach would result in a comprehensive analysis of all available information on training needs and programs, supplemented with panel reviews and recommendations. These recommendations may include proposed field surveys to obtain additional information judged essential for future planning. Information gaps are most likely to be found in two areas: (1) training needs and preferences in the less numerous, less studied occupational groups, and (2) the effectiveness of major alternative methods of training. This section addresses the first problem, and the second is considered in the sections (D and E) on Tasks #3 and #4. In general, we advise against training needs assessment field surveys unless there is a compelling need for the information. Rigorous research in this area would be costly, and we are not convinced it would improve decisionmaking sufficiently to justify the cost. As noted earlier, the major survey options include self-perceived training needs of persons with and/or without AIDS-related expe- rience; training needs as perceived by supervisors and trainers; objective tests of knowledge, attitudes, and practices; and task or functional analysis studies. These types of surveys could be carried out either on samples of persons selected to represent different types of program emphasis, work settings, and patient risk behaviors, or on convenience samples such as at national conventions of the selected occupation groups or in readily accessible programs. We do not believe the great cost and complexity of a statistically representative sample and/or of large objective knowledge, attitudes, and practices tests is now justified.

With the previous caveats noted, let us suppose that the data analysis and panel review phases result in a firm recommendation to obtain field survey data on the training needs of one or more occupations. In this event we propose the following:

* Primary research questions. What are the self-perceived training needs of persons with prior experience in the delivery of AIDS care; what is the relative emphasis that

should be given to these needs; what are respondent views with regard to the preferred methods of receiving this training; and what are the likely prerequisites to obtaining training?

* Intended target population. Persons with prior AIDS experience, which in this case we define as those who have spent at least 10 percent their time working with HIV infected persons over 6 months or more. We do not believe a survey of persons without prior HIV experience would provide much useful information.

* Survey settings. We propose convenience samples, making use to the extent possible of persons identified through the panels, literature review, and demonstration programs who would be willing to facilitate the study. The samples should include persons who work both in public and private sector settings, in hospital, ambulatory and community settings, and those familiar with IV drug users as well as gay and other risk groups. We believe most of the survey respondents should be found through work settings, although obtaining additional respondents at national conventions or the like should not be precluded.

* Sample size. 100-150 total should be sufficient to indicate the likely range and distribution of responses. We do not believe rigorous statistical validity should be sought in this survey.

* Survey method. A questionnaire requiring no more than 25-30 minutes to complete, perhaps followed up where feasible by a postquestionnaire discussion group. This latter option, which we consider desirable, would best be done in conjunction with surveys carried out in collaboration with, say, one of the review panelists at his or her base of operations. We do recommend including respondents who are supervisors as well as staff. We do not recommend attempting to collect matched information both from staff and from their supervisors to measure concordance of views with regard to the needs of specific individuals; this information can be quite revealing in some situations but greatly increases survey costs.

* Questionnaire design and application. We propose that a generic self-perceived training assessment questionnaire be drafted without reference to any one specific occupational category. Appendix C outlines in some detail how this questionnaire would be applied and proposed content. Once the overall content of the instrument has been specified, occupation-specific modifications can be made as necessary. Wherever possible, questions that have been previously field

tested and standardized should be included on the survey instrument, especially for those questions concerned with attitudes toward HIV-infected patients and high-risk groups.

This survey approach would not attempt to address in detail the important and complicated problem of attitudes towards and fear of treating AIDS patients. These attitudes have great relevance for many aspects of the workforce issue, for example, recruitment, retention, and performance in both the technical and communication aspects of health care. We know something about these attitudes and their probable effects on performance, but we still know very little about how to change them.

The field surveys could be completed during months 13-18 and the results included in the draft final report, to be sent out for review several months later. Based on our review of the literature and our interviews with various professionals involved in training, we believe that perhaps only two or three surveys might be necessary and that possibly none will be required. This assumption is based in part on our belief that with another year or two of experience in the many training programs and service delivery demonstration projects now in operation, and with input from the review panels, those concerned with training will have a reasonably good idea of who needs training and what content areas need emphasis. Table 4 provides a suggested timeline for Task #1.

C. Proposed Task #2: Description of Existing Training Approaches

1. Overview of the Proposed Approach

As a first step in assessing strategies for ensuring adequate training opportunities for workers caring for persons with AIDS, it makes sense to document the full range of training activities currently underway. We have identified many of the training initiatives in this protocol, but a more comprehensive assessment of training activities should be undertaken.

The assessment of training activities should take place before the panelist meetings, described as a part of Task #1. The information obtained about training activities actually operating will be part of the input provided to the panels when they meet and can help them develop recommendations about training needs and methods for meeting these needs.

We suggest that an assessment of training activities be undertaken using two strategies. First, a mail survey of organizations known or thought to be giving training should be carried out. A series of detailed case studies should then be conducted to document key characteristics of each type of training approach. These case studies will help guide organizations considering training options, as well as public agencies considering training programs.

The main products of this task will be a descriptive inventory of training initiatives and a topology of approaches to training. The inventory and topology would result not only in information about the range of approaches used but also about their relative frequencies, capacities, and potential for expansion.

The process of documenting strategies for training approaches should include four subtasks: (1) a literature review, (2) the survey of training activities, (3) the convening of panels of experts, and (4) case studies of key approaches to training. These subtasks are described in the following paragraphs.

2. Synthesis of Existing Information and Survey Methods

As discussed earlier in the protocol, AIDS-related training currently takes a wide variety of forms and is being conducted in numerous settings:

* AIDS Education and Training Centers supported by HRSA

* CDC-funded training program

* Hospitals and other service provider programs in specially set up programs or as part of existing continuing education or new orientation programs

* Professional associations, contractor organizations, and

* Various other community-based organizations

Efforts should be made to identify all organizations that 1) provide ongoing training programs that meet specified inclusion criteria (see Appendix D for a suggested list of such criteria), and 2) that, in the aggregate, provide the great bulk of such training in the U.S. Program can be identified fairly quickly through telephone inquiries to local health departments, hospital associations, community organizations, and universities. In addition, an extensive literature review, building and expanding on the review included in Part II of this protocol, should be completed. This review should be analogous to the synthesis outlined under Task #1, and should explore the same sources outlined in that part of the protocol. The literature review, in addition to identifying types of organizations involved in training, will directly provide some descriptive and evaluative information on training approaches.

After identifying all possible local organizations involved in training, mail surveys should be sent to each organization. The surveys should be administered in each of the 20 metropolitan areas with the largest AIDS caseloads and in an additional sample of geographic areas that will permit an assessment of what, training activities are being conducted in smaller areas with lower incidences of AIDS. The areas with the largest AIDS caseloads are each included in the sample because it is likely that innovative approaches to training, to the extent that they exist, will be found in those areas treating the largest number of persons with AIDS.

Appendix D gives additional information on how the training program survey could be carried out and the kinds of information that should be collected. Whenever possible a copy of the curriculum in use should also be requested. The complete survey protocol and instrument should be prepared as part of proposed Task #2.

The main products of the survey are (1) a topology of the range and kinds of training programs offered; (2) quantitative estimates of current program capacity, of projected capacity, and of the potential for expansion; (3) indications of potential problems affecting the delivery of training; and (4) case studies of programs selected to reflect major training approach options and/or innovations. A fifth and potentially very useful product could be information on program and per trainee costs. A decision on whether to seek cost information will have to await the outcome of the survey pretest, but if it proves feasible to collect meaningful cost data by mail questionnaire with followup telephone calls, this could provide an important supplement to the more precise cost data collected in Task #4.

Based on our literature review and interviews, it is already possible to specify many of the key dimensions of a probable topology of training. For example, we know that approaches vary according to sponsorship, duration, scheduling, teaching/learning objectives, occupational categories, and teaching methods. The survey results will expand these examples into a complete topology and organize the quantitative information about program capacities, and other factors accordingly.

3. The Role of the Expert Panels

The panels of experts described as part of Task #1 can play an equally valuable role in aiding this task of documenting and critiquing existing training approaches relevant to the several different occupational categories under review. Most of the information from the training program survey should be available prior to the convening of the panels, around months 9-10. Based on their reviews the panels can recommend improvements in the program topology; identify additional types of training activities not previously studied; help identify training problems and constraints that require further investigation; and recommend training approaches that should be priority candidates for case studies (Task #2) and for detailed evaluations (Task #3). As discussed later in the protocol, the actual selection of sites for in-depth impact and cost evaluation will be made in close consultation with the Advisory Committee and the funding agency.

4. Case Studies of Selected Training Initiatives

In addition to the mail survey, it would be useful to visit a sample of the organizations involved in training and to observe directly how the training is done. Organizations would be selected to represent major alternatives to how training is done and/or innovations that merit closer scrutiny. The desired products of these visits would be a more detailed account than is possible by a mail survey of how training is in fact carried out and an initial effort to determine whether some training strategies seem to work better than others. This latter product can help generate hypotheses about factors related to training effectiveness, hypotheses that will be important for the development of proposed Task #3.

The starting point for the case studies is their stated goals and objectives. From here one should seek to determine whether these goals and objectives are likely to be met and, if so, what factors might account for success or failure. Suffice to say that in the absence of the more detailed before and after training measurements proposed in Task #3, these conclusions will, of necessity, be only "informed judgments." The types of information collected as part of the case studies should include observational data concerning organizational characteristics of the training program and the actual training approach used. For example, the case study should collect information that would result in answers to questions such as:

* How does the program recruit students and trainers?

* How does the program develop curriculum? With participation of professional associations? With participation of advocates? With participation of academic experts?

* How does the program distribute training time to issues related to knowledge vs. skills vs. attitudes vs. awareness?

* How does the program evaluate satisfaction and performance of students? What mechanisms are there for responding to poor evaluations?

* What teaching styles are used: didactic, small group interaction, role playing, or case studies. What evidence is there to suggest their relative effectiveness for to specified training objectives?

The case studies can begin following completion of the description and topology that results from the survey of training programs. At least one program of each of the major types of training approaches should be included in case study part of Task #2. Between 5 and 10 case studies should result in a reasonably good picture of the range of training approaches, and this protocol's estimate of resource requirements assumes that 8 such studies are done.

Each case study should be done at a time when a training program is in progress to allow for direct observations. We estimate that 2 to 3 days on site should be sufficient to collect the required information about organizational factors and teaching approaches that characterize a given training organization.

D. Proposed Task #3: Training Program Evaluations

1. Overview of the Proposed Approach

To meet training needs effectively it will be important to assess what types of training programs seem to be most successful in accomplishing training goals. By 1990 or shortly thereafter, the results of training program evaluations that are proposed here may provide sufficient information for informed choices about the preferred training approaches for the future. If sufficient information is not forthcoming, we recommend that serious consideration be given to carrying out a careful evaluation of at least three or four types of training approaches in order to measure effectiveness and cost-effectiveness in meeting specified goals. We acknowledge that rigorous educational evaluation is difficult and, except in trivial situations, is apt to encounter many confounding variables. This would be especially true in the case of AIDS training since for the most part it is short term, it is often intermittent, and most individuals who would take such training are also exposed to many other sources of information and experience. To conduct such an evaluation with a reasonable chance of success, therefore, we believe it will be necessary to use a quasiexperimental research design that can compare the effectiveness of the different types of training. In addition to cross-program comparisons, the evaluation design should include a comparison (or control) group that has not received any training.

The evaluation strategy that we propose can build on initial steps being taken by HRSA to evaluate some of its training activities. HRSA is currently contracting for an initial evaluation of its AIDS Education and Training Centers (ETCs). The evaluation, which is limited in scale, will assemble operating statistics (such as number of people being trained in each profession at each ETC) for each ETC. In addition, the evaluation will synthesize information from existing course evaluations that have been done by the ETCs and will make some attempts to assess the impacts of the ETCs on the level of training within the communities served by them. The evaluation does not involve primary data collection, but will attempt to assess impacts based on patterns found in existing surveys of providers conducted by professional associations.

While this initial evaluation of ETCs is a useful first step in assessing the impacts of training programs, the protocol proposed here would use more extensive data collection strategies and more comprehensive analytical approaches to improve our understanding of what types of training programs work best. In addition, the target of evaluations in the study proposed here would include an array of organizations doing training besides just ETCs.

2. Proposed Methodology for Program Evaluation

a. Selection of training programs to evaluate

It is not possible at this time to identify precisely which organizations and which models of training programs to evaluate. Rather, these should be selected after completing the field phase and panel reviews proposed in Task #2, that is, after a description and topology of existing strategies have been completed. Sites should be selected that represent "mature" examples of a training approach so that the evaluation does not confuse ineffectiveness due to early implementation problems and ineffectiveness due to an ineffective training strategy.

At least three or four training approaches should be studied, with the final number depending both on resource and programmatic considerations, that is, the number of major alternative approaches about which choices must be made. The evaluations would be most useful if assessments are made of training approaches that are used for more than one type of profession. However, in making assessments concerning the impacts of alternative training approaches, it will be necessary to treat each type of provider receiving the training as a separate subsample. It is very possible that a specific training strategy could work for one type of worker but not for another.

Actual site and model selection should be made in consultation with the Advisory Committee. The contractor should make an initial set of recommendations with a rationale for the set of sites selected. The Committee could then endorse the selection or recommend changes; final choices of sites would have to be approved by the grant monitors.

b. Outcomes to be evaluated

The evaluation should attempt to assess both the direct effects of training programs on the knowledge, attitudes, skills, and subsequent activities of those who are trained, as well as the presumably much more subtle indirect effects on those who later come in contact with the trainees. These indirect effects could be exerted at several levels. For example, the principal goal of train-the-trainer programs is to prepare persons drawn from various health facilities to assume training responsibilities at their home institution. Even if those enrolled in such programs do not actually teach back at their work sites, some diffusion of the information learned at the training program should occur by example and by natural interaction among coworkers. Thus, an effective training strategy should have effects beyond the sample of individuals receiving instruction. Of course, it makes sense to pay close attention to measuring the effects on those actually trained because diffusion to other workers will not occur if training has had little to no effect on trainees.

The training program outcomes to be evaluated can be determined in large part based on the stated training objectives regarding knowledge, skills, and attitudes. Studies cited in Part II can provide a useful source of evaluation instruments to measure change in each of these areas and these will likely be refined in the coming year as the ETCs begin their own self-assessments. The contractor should review available instruments for measuring changes in trainee knowledge, skills, and attitudes as well as the more conventional posttraining evaluation instruments to obtain trainee impressions of the program. From this review it will be possible to develop appropriate evaluation instruments that build on this accumulated experience, while at the same time maximizing the opportunity for interprogram comparisons.

It will be especially difficult to measure changes in skills, since such measurements often require direct observation of extrainee performance. To the extent that skill development is an important goal for some of the programs selected for evaluation, the evaluator will need to make plans either to measure changes in skills or, as a less desirable but more feasible alternative, to document the training component that addresses skill development. Given the difficulties with skill measurement, however, we think the major emphasis of the outcome evaluation should focus on changes in knowledge, attitudes, and in posttraining AIDS-related activities.

c. Sampling

We recommend that the unit of analysis for the evaluations be individual health care providers who deliver services to persons with AIDS. Two types of samples should be studied in each geographic study area: (1) individuals who receive training, and (2) individuals who do not receive training directly from the program but who work with those who did. Sampling should be done randomly from the appropriate populations in a given target area. Sample sizes can be determined using standard power analysis after expected variances among outcome variables are determined.

Since the diffusion effects of training on the sample of coworkers are likely to be smaller than for those individuals actually enrolled in formal program, the coworker sample size will have to be larger. It probably will be necessary to match each person enrolled in a training program with at least two coworkers who were not enrolled in the program. In general, the coworker samples should include individuals in the same occupation as the individuals enrolled in training. However, in the case of physicians and nurses, it is possible that there is diffusion of attitudes, of what might be termed an "AIDS awareness," and perhaps knowledge from these professions to other workers caring for persons with AIDS. Thus, an additional sample of coworkers who are not physicians and nurses should be surveyed when assessing the indirect impacts associated with the training of physicians and nurses.

d. Comparison group strategy

An important element of any evaluation study is the comparison approach used to assess whether a program is influencing the behavior of those receiving the treatment. The strongest comparison approach in an analytical sense is generally an experimental design where a group of individuals is randomly assigned either to receive the treatment or to be a part of a comparison group that does not receive the treatment. Randomization best ensures that the treatment and comparison groups are alike in all ways other than in exposure to the treatment.

In the absence of randomization, which is often difficult to implement, an evaluation design must rely on other methods for selecting a comparison group which is as much like the treatment group as possible. This is generally done by matching characteristics of the two groups as much as possible or by using statistical approaches to adjust for differences in characteristics. Examples of especially important variables will include the amount and nature of AIDS-related self-study and/or experience prior to the training program that is being evaluated, the likely imminence of posttraining involvement in such care, and whether training is primarily at the initiative of the trainee or of the employer.

For the proposed evaluation of alternative training approaches, we recommend that several comparison approaches be explored by the contractor. The best possible approach will depend on the exact context of the sites evaluated.

As mentioned previously, there are two types of effects that should be assessed in the evaluation of training approaches: (1) the effects of the programs on the people actually trained, and (2) if feasible, the indirect effects of the programs on people who work with the former trainees. Each of these two assessments require distinct comparison group strategies.

e. Direct effects of training on those trained

Evaluation of three or four alternative training approaches can provide an opportunity to have several internal comparison groups, that is comparing the effects of each of the evaluated training approaches with those obtained by the other approaches. This type of comparison is acceptable when wishing to compare the relative effectiveness of alternative training strategies. Each treatment group can act as a comparison sample for the other treatments if the characteristics and major training objectives of each treatment group are similar or if statistical techniques can adjust for any major dissimilarities.

To assess the effects of each training approach relative to the alternative of no training, it is necessary to form a distinct control sample of individuals who receive no special training. We expect that just one such control sample will need to be selected for all studied programs and locations. This control sample can then be used to assess the impacts of each training approach relative to no training.

The control sample should be selected from a location that does not overlap with the area served by an evaluated training program. Having a geographically distinct control group is important in order to be sure that diffusion of training is not affecting the behavior of the control group.

We recommend that the control sample be selected after learning the characteristics of the individuals being trained that characteristics that might influence the outcomes being assessed can be matched as closely as possible in the control group. It will, of course, be essential to match the control and treatment samples in terms of type of worker. For example, social workers would be compared with social workers.

f. Indirect/diffusion effects of training

The more difficult and perhaps infeasible part of the evaluation is to assess whether training programs are having indirect effects on workers in direct contact with trainees and in the community in general. The main problems are twofold: measuring relatively subtle effects in an health care environment where AIDS information abounds, and identifying persons that would have a reasonable chance of being informed and/or influenced by those who have received AIDS training.

The best starting place to look for the indirect effects of training would clearly be persons who work in the same institutions as those who receive training. In the evaluation design one could, for example, collect information on each trainee plus one to four other individuals who work in the same location. The additional sample members should work in the same types of jobs as the person who was trained but they should not be among those who were trained. The new sample of individuals should receive the same data collection instruments used to measure behavior and behavior changes in terms of the knowledge, skills and attitudes.

A control group for the several treatment samples will need to be identified in a community where very little training has occurred. However, to make the control and treatment groups roughly comparable, the incidence of AIDS should be not dissimilar across the several sites. This may ultimately prove infeasible, especially by the time this project could realistically get under way, for example, latter 1990, in which case the control sample would have be drawn from the same communities as the treatment samples.

g. Data collection strategy

Survey data will need to be collected to measure characteristics of the three types of groups studied: individuals trained, individuals who work with those trained, and control samples. Basic demographic information and prior AIDS-related training and/or experience will need to be collected in order to be able to adjust for any differences in characteristics across the samples, along with information about knowledge, skills, attitudes relative to the care of persons with AIDS. We recommend that data be collected at three times: (1) just before the start of the training program, (2) about 1 month after the training program is completed, and (3) 12 months after the training program is completed. This last cycle may have to be moved up to around 6 months after training if it seems probable that most trainees will be exposed to so much additional short-term AIDS training and/or practical experience following their initial training program as to confound the evaluation.

We suggest that if at all possible, the first interview be done in person. This will be easy to implement in the case of those receiving the training since these individuals will be in one place at the time of the training. Interviews will be more difficult for the samples of controls and colleagues (of those who are trained). However, some personal contact with these individuals will be desirable to gain their agreement to participate throughout the data collection cycles. We expect that each of these individuals can receive their baseline interview at the time that a recruiter gets them to agree to be part of the evaluation.

The 1-month and 1-year posttraining surveys can be done by mail. Most of the questions concerning behavior and outcomes will be repeat questions from the pretraining interviews, so the respondents should have no difficulty understanding what is expected of them. They would additionally be asked to critique their training in the light of subsequent developments and needs. Small cash incentives ($5 to $10 per survey) would help ensure high completion rates.

We recommend two followup surveys in order to measure both short run and longer run changes in behavior and knowledge, skills, attitudes. The longer run assessment is especially necessary to identify any indirect effects of the training programs on coworkers of those who were trained.

E. Proposed Task #4: Training Program Costs

1. Overview of the Proposed Approach

The research we propose on the issue of costs of training would build directly on the analytical findings of the first three tasks. The goals of the cost analysis would be to measure the cost per person trained using alternative training approaches and to obtain information necessary to permit national cost estimates based on recommendations developed in connection with Task #1.

A major uncertainty in making any national cost estimates, as discussed earlier in the protocol, is the difficulty in specifying how many people will actually need to be trained. Since training needs are likely to exceed funds for training in the short run, actual expenditures on training will likely be driven by total funds available. The number of people who need to receive formal training also is uncertain because it is still too early to judge how effective the train-the-trainer approach will be in diffusing training, by both direct and indirect means, to the co-workers of those who are trained. However, the analysis proposed can forecast what total resource requirements would be if all training needs were met under varying assumptions about training needs.

The approach to estimating costs proposed here is an accounting approach. It is essentially an accounting exercise to judge, based on the experience of early training programs, what the costs of training should be when using a given strategy. However, some nonaccounting judgments are needed to assess whether the actual staffing used by existing training programs is efficient, and whether there might be economies of scale if training initiatives were substantially expanded.

2. Determining the Cost Per Person Trained

a. Selection of training approaches

The first step in the cost analysis is the selection of training approaches to analyze. At a minimum, the analysis should include the training approaches that are evaluated during Task #3. By determining costs for these programs, the cost analysis and training effects evaluation can be combined to result in a cost-effectiveness study.

The cost part of the study also should be expanded to those examples of training identified in Task #2 that are thought to be potentially important elements of a national training strategy. Although it would not be possible to evaluate each of these training approaches to the degree proposed in Task #3, cost analyses of at least the case study programs will be less expensive to conduct, and thus a larger number of approaches can be studied. As noted in the discussion of Task #2, if cost information can also be collected by mail questionnaire in the national training program inventory, this could further supplement the more detailed information collected by other means.

The exact selection of training initiatives to include in the cost analysis should be made after completion of Task #2. As in selecting initiatives for evaluation in Task #3, the contractor should consult with the Advisory Committee regarding programs proposed for cost analyses, and final choices should be approved by the funding agency.

In general, training initiatives can be classified as free standing or as a component of the activities of a service delivery organization. By free standing we mean a program that has been established specifically to train for service providers caring for persons with AIDS. In this situation, all of the program's resources are devoted to one mission, which is the training mission being evaluated. Other training initiatives will be added to existing programs or organizations and will represent just one of many activities undertaken by the program or organization. For example, a hospital may decide to organize 3 days of in-service training for all new nurses, or a hospital may decide to have all nurses participate in a program to change attitudes and awareness concerning AIDS that meets for 1 hour three times per week for 6 months.

The task of measuring costs varies depending on whether the training initiative is free standing or represents a marginal activity of an existing organization. The following sections describe accounting methods that can be used in each case.

b. Cost Determination for a free-standing training program

To measure costs for free-standing programs, the expenditure records of the program can be used directly. A researcher with accounting skills can assess expenditures for each of the major expenditure categories such as personnel (teachers, administrative, support), space, travel, supplies, and equipment. It is important to assess actual expenditures rather than budgeted expenditures.

To do this analysis it is essential to have cooperation of the training program, for which a promise of confidentiality of findings would probably be essential. Results could be reported for the type of training program, and the actual name of the training program could be withheld. In the case of training programs receiving federal funds, expenditure records should be public record thus assuring access to the required record for this large subset of training programs.

In addition to direct expenditures for training, the indirect costs of the programs should be measured. These indirect costs involve lost hours of work that the student spends in the training program. A major source of variation in costs across training programs could be in the amount of time they take workers away from their jobs. We suggest that these indirect costs be measured using standard economic approaches that involve calculating hours lost from work and valuing these hours at the hourly wage rate of the worker. It will be necessary to measure hours lost from work and hourly wage rates as part of the data collection efforts described for Task #2.

c. Cost determination for training done as part of other activities

The measurement of costs when joint products are being produced is a more difficult task. The difficulty arises because some resources are used at the same time for multiple purposes. An obvious example of this is infrastructure items such as heat and lighting. These services are shared by all activities occurring in a given location.

When training is done as part of other missions of an organization, it takes a careful accounting to allocate shared resources to one activity or another. Generally accepted accounting principles have been developed that usually can guide an accountant in making decisions about how fixed costs should be allocated across activity centers. At times, allocation decisions require observational data on relative time spent on different activities by staff. This can be collected using self-reporting logs or using more reliable time-motion observations by a trained coder. We expect that at least one of the training programs assessed will represent a marginal activity to an existing organization. For such programs, we suggest that the extra resources needed to run the training program be measured, and then that accounting approaches to allocating fixed costs be used to determine the full costs of the training activity.

3. Determining National Costs for a Training Approach

Once costs are measured on a per person trained basis for each type of training program studied, national cost estimates for these types of programs can be determined by multiplying costs per person for a given training program times the number of people that require that type of training. As emphasized throughout this protocol, however, precise estimates of how many people actually require training are unlikely to be available for the foreseeable future. Thus, estimates of national costs using alternative training strategies will be only as good as the assumptions made to estimate the aggregate number of people requiring training.

For this reason, we do not recommend that the development of national cost estimates be a major part of the research protocol. Rather, straightforward projections of national costs based on the estimates of per person costs discussed earlier should be made using a range of alternative assumptions about the number of people who will require training. Besides assumptions about the number of people in need of training, some assumptions about the likely indirect effects of training through the train-the-trainer mechanism will be required to make cost projections. The analysis of Task #3 will provide some guidance in making inferences about the indirect effects of training.

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Additional, less structured discussions were held with numerous persons on specific topics.

APPENDIX B

TRAINING NEEDS ASSESSMENT: SURVEY METHODS AND INSTRUMENT

Objectives: To solicit the opinions of different categories of health workers and volunteers now involved in HIV-related care regarding training needs for such care.

Methods: The draft survey instrument outlined below would be developed into a finished product, pretested, revised, and then used on samples of those occupational categories for which no other adequate source of information is available, either from survey results or expert opinion. We propose that completed questionnaires be sought from at least 50 and preferably 100-150 persons from each occupational category on which it is used through use of convenience samples obtained from at least three different geographic and program sites. For doctors and nurses we propose a sample size of at least 100 each, with about half of the respondents to be chosen from private practice settings. All respondents should meet the minimum inclusion criteria of 10% or more of their time spent in providing HIV-related care over at least 6 months. The convenience sample should seek to obtain within each occupational category a reasonable distribution of persons according to type of work activity, client risk group, and ethnic background. We believe that at least some of the surveys could be facilitated or directly conducted by the panelist members, described in Section 4 (Task #1). The possibility of using focus (or discussion) groups among experienced HIV-care providers to supplement, or even as an alternative to gathering information by means of individual questionnaires, should also be considered.

Survey instrument: The questionnaire outlined below provides a general indication of the information to be sought; it is not in completed questionnaire format and it would be best to develop a somewhat different survey instrument for volunteers and perhaps for private medical and dental practitioners. Field tested questionnaires from prior studies should to be collected during the initial phase of Task #1 and, together with consultations with survey principal investigators and knowledgeable panelists, could provide valuable input to questionnaire development.

Training needs assessment questionnaire

Cover letter: Sponsoring authorities; purpose and importance of the survey; explanation of what is meant by "HIV-related work"; instructions and estimated completion time (max. of 30 mins.); assurance of confidentiality; thanks for cooperation.

Questions about you and your background

Please indicate your occupational category [checklist or alternatively, appropriately modified occupation-specific questionnaires]

administrator
dentist
emergency medical technician
licensed practical nurse or equivalent
medical doctor
occupational therapist
physician assistant
psychologist or other mental health specialist
registered nurse
respiratory therapist
social worker
volunteer
other

For about how many years have you been working half-time or more in health-related work? _____ years

In what city or town do you work?

What is your employment situation with regards to HIV-related work? self-employed____ employer_ __________________

For about how many months in all have you been spending 10% or more of your time on HIV/AIDS-related care? ______ months

About what percent of your time have you spent on HIV-related care during the past month? ______ %

Briefly describe your primary responsibilities at the present time with regard to HIV/AIDS-related care? What kinds of services do you provide to persons who are either HIV infected or at significant risk of infection?

Questions about your training experiences

What specialty training, if any, have you had in disciplines or topics that do not relate directly to HIV infection, eg., a medical, nursing or other specialty?

Do you have any recognized specialist qualifications?

____ no; ____ yes; please specify ___________________

Have you participated in an organized, formal training activity on HIV-related topics, excluding brief (under three hours total time) on-the-job training and orientation? Please indicate about how much time in total and the principal topics or areas of emphasis.

___ hours (or days) of time in organized HIV training programs

principal topics or areas of emphasis:

Please briefly note what other sources of information about HIV/AIDS you have used in the past six months and the (very) approximate number of hours spent on each...

____ hours of clinical conferences, seminars, meetings

____ hours of reading books or journals on AIDS topics

____ hours of informal discussions about AIDS with colleagues

____ hours of other sources [please specify]

Your views about needed training

The next several questions ask for your views regarding the training and orientation needs, if any, that a new staff member or practitioner of your discipline (doctor, nurse, volunteer, etc.) should optimally receive if he or she were to assume HIV/AIDS-related duties similar to yours. Suppose further that this individual comes without any specialized training or prior experience relevant to HIV infection. Please indicate the approximate amount of time that you think should be allocated to each topic or skill during the first three months of his or her orientation about HIV/AIDS. If you wish to clarify your response or add new topics, please do so.

[Question starts on the next page]

APPENDIX B (cont.)

Topics or skills	No time	1-14 mins.	15-30 mins.	31-59 mins.	1-2 hours	>2 hours
Basic HIV information or concepts						
virology						
epidemiology						
risk behaviors						
transmission						
infection control						
antibody testing						
Clinical topics						
immunological aspects						
neurological aspects						
psychological aspects						
gastroenterological aspects						
opportunistic infections						
tumors / Kaposi's sarcoma						
dermatologic conditions						
eye/ear/nose/throat aspects						
patient management						
diagnostic tests/x-rays						
sexual history-taking						
prenatal/perinatal/neonatal						
other (specify)						
other (specify)						
Psycho-social topics and issues						
patient counseling and support						
gay lifestyle issues						
IV drug use issues						
ethnic/racial minority issues						
patient education/motivation						
ethical issues						
legal issues						
death and dying issues						
other (specify)						
other (specify)						

About how much total HIV/AIDS training & orientation time would you consider desirable during the initial orientation phase to AIDS work, ie, prior to or during the first three months of employment?

____ hours, or ____ days

Comments:

Should the recommended training / orientation be provided in a single block of time or should it be divided into several sessions?

____ single block, or, ____ (number) of sessions

Comments:

Approximately how should this time be allocated?

___% to increasing knowledge, eg, modes of transmission, HIV infection control

___% to developing new skills, eg, counseling, providing emotional support, taking a sexual history, performing specialized procedures.

___% to addressing issues bearing on to one's own attitudes, values, and fears as they relate to the risks of infection and to providing care to persons with high risk behaviors

With regard to this last area -- attitudes, values and fears -- please indicate the preferred teaching/learning method(s) for dealing with attitudinal issues, eg, videotapes, readings, lectures, discussion groups, role playing.

What suggestions do you have regarding the frequency of organized HIV-related refresher or continuing education (CE) training, and how much time should be allocated to this activity?

frequency of CE: ____ times per year

amount of time per CE session: _____ hours

Comments:

best copy available

To what extent has your own training or orientation matched the recommendations you gave above?

___ I received little or no formal training or orientation

___ for the most part my own training/orientation has matched my recommendations

___ my training/orientation had significant gaps or limitations

Please indicate which were the most important gaps or deficiencies

[NOTE: The next question may prove superfluous on pretest.]

Many health care employers do not yet provide HIV-related training opportunities at company expense and on work time. In the absence of employer-paid training and release time, approximately what percent of the HIV-care staff in your occupational category do you think will obtain, with their own resources, specialized training?

_______ % will likely seek training on their own without employer support

Comments:

Do you believe employers should require all staff of your category who are directly involved in some aspect of HIV/AIDS care to receive organized training above and beyond that normally obtainable through on-the-job orientation and experience?

_____ yes, organized training should be required

_____ no, on-the-job training/orientation is sufficient

Comments:

How much HIV-related training should be provided, if any, to persons in your occupational category who are not now involved in HIV-related care? Such training would presumably involve some general orientation about ARC/AIDS, about infection control, and perhaps about attitudes towards HIV infected persons and risk groups.

____ no training required for those not now involved

____ should receive some training (please indicate major topics in declining order of importance)

Comments:

Do you have any other thoughts or suggestions to make that would help us design good, cost-effective training programs? Please list them here.

Thank you for your time and cooperation.

APPENDIX C

TRAINING NEEDS ASSESSMENT: SURVEY METHODS AND INSTRUMENT

Objectives: To develop a national estimate of training program activity; to develop a typology of programs according to major variables; to project near-term training capacity and to estimate the potential to expand this capacity; and to provide a sampling frame for the selection of training programs appropriate for more detailed study (case studies as part of Task #2, and program evaluations in Task #3). In addition, if other more accessible sources of much of this information are available, then the proposed survey would be unnecessary.

Methods: The survey would be conducted in the (approximately) 20 SMSAs with the highest prevalence of AIDS plus a sample of areas with lower prevalence presumed to have significant training activities in process. "AIDS- related training programs" (or initiatives) encompass a broad spectrum ranging from occasional short or one-time courses to extended full-time resident programs. Care will be needed to develop develop inclusion criteria to make the survey both feasible and useful. We have listed below some possible inclusion criteria that could be used to help decide which programs to include in the survey. Whatever the final list of criteria, they should be applied with some flexibility in order to accommodate special situations. According to this criteria, AIDS-relevant training programs should include:

* Offer formal, organized training activities that are primarily concerned with AIDS/HIV topics

* Have been operative for a least 1 year and have offered at least two training cycles to date

* Have the the intention of continuing AIDS-related training and at least one training cycle during the next 12 months

* Have had average enrollments of at least 15 persons in each cycle

* Provide at least 3 "contact hours", that is one-half day per training cycle

The survey instrument would be pretested and cosponsored or endorsement arrangements sought from appropriate organizations to facilitate gaining cooperation. The questionnaire would be mailed with followup by telephone as necessary. Every effort would be made to obtain copies of course outlines or schedules and evaluation instruments from the larger programs.

APPENDIX C (cont.)

Survey instrument: The questionnaire outlined below provides a general indication of the information sought; it is not in completed questionnaire format, and it might require significant modification for programs of widely varying characteristics. Persons involved in the HRSA-sponsored ETCs and area health education center (AHECs) could provide valuable input to questionnaire development.

Training program questionnaire

Cover letter

Purpose, scope and sponsorship; definition of eligible training programs; nature and estimated time commitment of requested participation; assurance of anonymity.

Training program characteristics

Name and address of sponsoring institution

Name, title and telephone number of respondent

Year the AIDS-related program was first offered: 198____

Number of training program cycles or offerings to date: _____

Approximate total number of trainees to date: ________

Course enrollments during the last three course offerings, or the total offerings to date, if less than three:

____ Approximate total enrollments

____ Desired enrollment per course

____ Maximum that can be accommodated per course

Comment:

Please describe briefly the primary intended sources of trainees for your program? For example, are you looking for persons: with no/or some prior AIDS-related training and experience; who are expected to become actively involved in AIDS-related care, or who will have only occasional contact with HIV-infected persons; whose participation is at the initiative of their employer, or who for the most part have come at their own initiative?

Approximate trainee distribution by occupational category:

___% medical doctors

___% registered nurses

___% LPNs, nurses aides

___% social workers or similar

___% psychologists or similar

___% administrators

___% volunteers

___% others [specify]

Comments:

Usual course or program duration?

____ hours of course time directly relevant to HIV/AIDS topics

____ hours of course time not relevant to HIV topics, if any

____ total hours of course time

Is the course content provided in a single block of time or is it distributed into several segments which are separated by intervals?

____ single block

____ several segments; how many? _____

If the course is divided into segments, please indicate why:

APPENDIX C (cont.)

What major changes in the duration, capacity, orientation, methods and/or trainee composition do you expect to make over the next 12 months, and why?

Duration:

Capacity:

Orientation:

Methods:

Trainees:

Comments:

With additional resources would you be willing and able to increase substantially your training program capacity, either through more frequent course offerings or increased course enrollment, or both?

no ____, no change in training capacity

yes ____

[If yes]: From the current training capacity of approximately ____ trainees per year we could increase capacity up to a maximum of about ____ trainees per year. The main prerequisites of such expansion would be (specify):

Thank you for your cooperation. Survey results will be presented so that the characteristics of, and/or comments about individual programs will not be evident. Individual program findings will not be reported without written permission.

What is the approximate distribution of the various sources of support for recent training programs?

____% from payments made directly by trainees

____% from payments made by trainee sponsors/employers

____% from grants or contracts [indicate primary sources]

____% from sources internal to the institution sponsoring the training program

____% from other sources [please specify]

100%

Comments or explanations regarding sources of support:

Approximately how many courses and persons do you expect to train over the next 12 months?

___ courses during the next 12 months

___ persons trained during the next 12 months

Comments:

What methods are now used to evaluate the course? [Please attach a blank evaluation questionnaire if available.] Are there any plans to modify or expand this evaluation in the foreseeable future? Please explain.

APPENDIX C (cont.)

What is your assessment of main successes of this type of course, as now delivered, with regard to any or all of the following?

trainee recruitment:

course content and/or methods:

course faculty or preceptors:

patient or client contact:

other (specify):

What is your assessment of main constraints and limitations of this type of course, as now delivered, with regard to any or all of the following?

trainee recruitment:

course content and/or methods:

course faculty or preceptors:

patient or client contact:

other (specify):

Are there any particular lessons that you feel you have learned from your experience so far that could be of benefit to other programs?

APPENDIX C (cont.)

What are the primary course / program objectives relevant to HIV infection -- what are the principal changes you want to occur with regard to one or more of the following areas?

knowledge:

skills:

attitudes:

behaviors and/or practices:

Please mark according to the below code the content areas addressed in that portion of the course devoted to HIV-related topics. Use '0' to indicate that the topic is not addressed; 1 = minor / some attention; 2 = moderate attention; 3 = substantial attention to the topic. If available, please attach a course schedule and syllabus.

___ HIV virology / immunology

___ HIV epidemiology

___ HIV infection control

___ HIV laboratory procedures

___ HIV prevention / education

___ HIV treatment, case management

___ psycho-social issues, support, individual counseling

___ legal issues

___ other [specify]

[NOTE: Depending on pretest results -- section could be expanded or might have to be reduced if respondents have too much difficulty providing cost estimates and/or or reluctant to do so.]

What are the estimated costs for each course offering and per trainee?

$________ per course offering, -- how much does it cost the sponsoring institution to put on the entire course?

$________ full amount charged per trainee, excluding any special deductions or reduced fees?

Comments:

☆U.S. Government Printing Office : 1989 - 241-256/00405